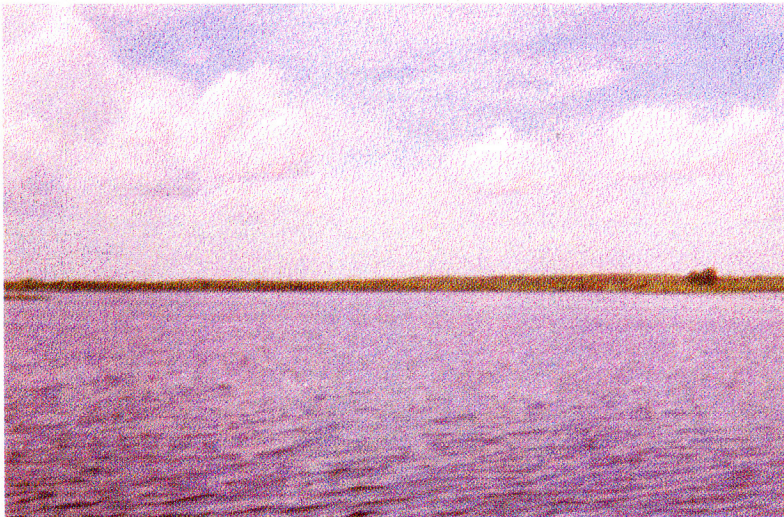


January 2004

LAKE HELL'N BLAZES

ECOSYSTEM RESTORATION REPORT WITH ENVIRONMENTAL ASSESSMENT

BREVARD COUNTY, FLORIDA



**US Army Corps
of Engineers®**
Jacksonville District
South Atlantic Division

SECTION 206

**LAKE HELL'N BLAZES
AQUATIC ECOSYSTEM RESTORATION
BREVARD COUNTY, FLORIDA**

**SECTION 206 ECOSYSTEM RESTORATION REPORT WITH ENVIRONMENTAL
ASSESSMENT**

JANUARY 2004

EXECUTIVE SUMMARY

Lake Hell'n Blazes lies near the headwaters of the St. Johns River in Brevard County. Before 1960, the lake was noted as a premier fishing lake in the state of Florida. Also, because of the excellent water quality in the watershed, a surface water treatment plant was built in about 1960 on downstream Lake Washington. This plant continues to supply potable water to the City of Melbourne.

Agricultural development over the last 50 years has caused accumulation of large amounts of sediment in Lake Hell'n Blazes, to the point where the lake is at or near its capacity to contain sediments. Due to the accumulation, fish populations have been reduced as spawning habitat has been lost. Lake Hell'n Blazes and downstream Lake Washington have also been known for their excellent water quality and one of the few surface water treatment plants in Florida is still in operation on Lake Washington. However, in 1992, a weather event caused a shift in sediment to downstream Lake Washington that led to a fish kill of approximately 13,000 fish due to low dissolved oxygen levels.

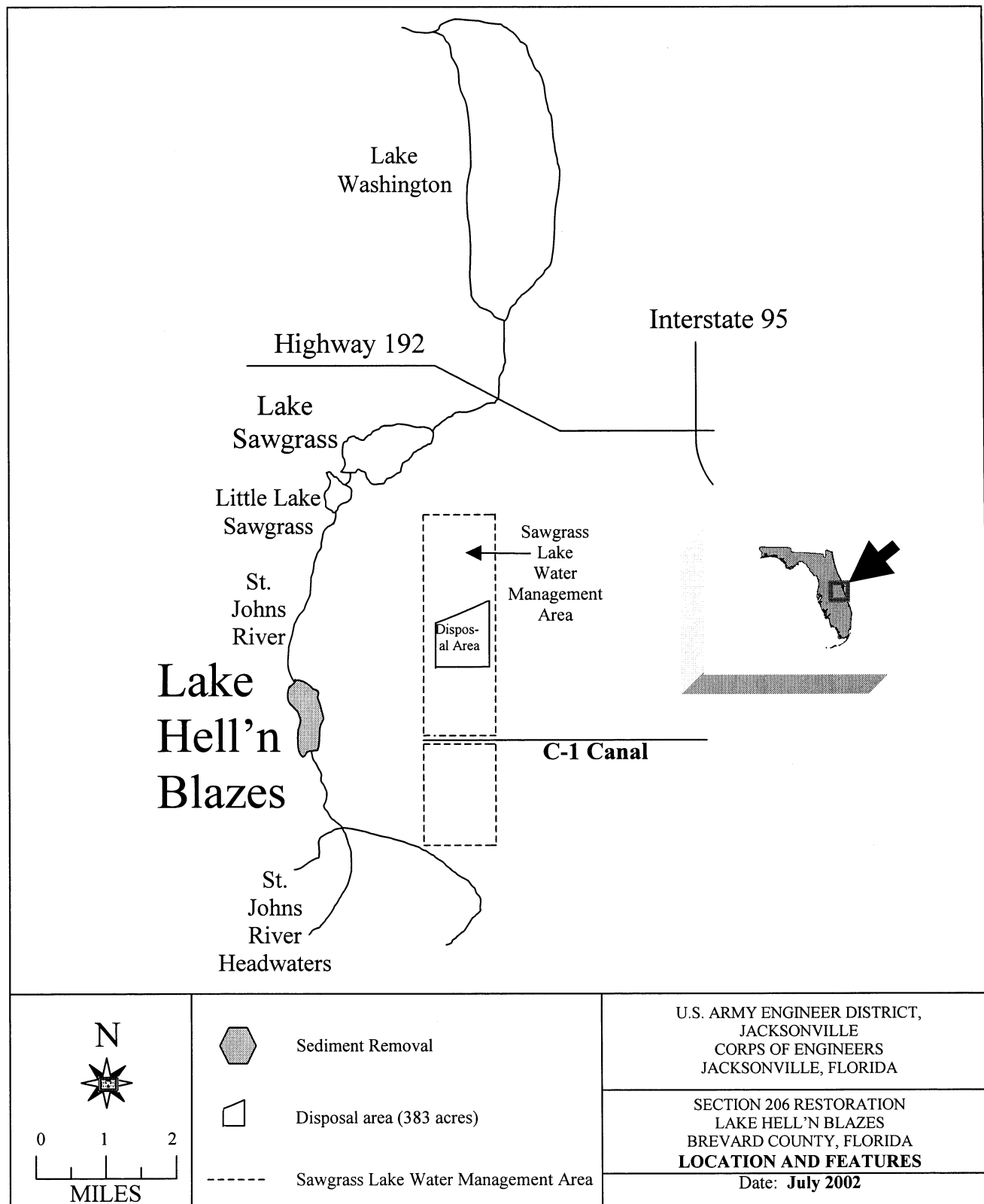
To significantly lessen the introduction of sediments to Lake Hell'n Blazes, separate efforts are underway and planned in the watershed. These actions alone are insufficient to restore habitat, and sediment removal from Lake Hell'n Blazes is recommended.

This report provides the results of engineering and environmental studies for implementing the Section 206 Lake Hell'n Blazes Ecosystem Restoration. The following page illustrates the restoration components of the recommended plan. The purpose of the project is to restore quality fisheries habitat and to improve and protect water quality. The recommended plan consists of removing the sediment from Lake Hell'n Blazes. The removed sediment is to be beneficially placed near the lake within the Sawgrass Lake Water Management Area. The placed sediment will improve the disposal site's ability to function as a wetland treatment area.

The environmental restoration will result in the creation of approximately 258 acres of improved habitat. The environmental restoration has a total estimated cost of \$6,490,462.

Recommended Plan

(Remove sediment from Lake Hell'n Blazes)



LAKE HELL'N BLAZES
AQUATIC ECOSYSTEM RESTORATION
BREVARD COUNTY, FLORIDA

SECTION 206 ECOSYSTEM RESTORATION REPORT
MAIN REPORT

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**LAKE HELL'N BLAZES
AQUATIC ECOSYSTEM RESTORATION
BREVARD COUNTY, FLORIDA**

FEASIBILITY REPORT

1 STUDY AUTHORITY

This report is submitted under the authority of Section 206 of the Water Resources Development Act (WRDA) of 1996 (PL 104-303), as amended. The act reads, in part, as follows:

“The Secretary may carry out an aquatic ecosystem restoration and protection project if the Secretary determines that the project - (1) will improve the quality of the environment and is in the public interest; and (2) is cost-effective.”

The goals for the Lake Hell'n Blazes aquatic ecosystem restoration project are to restore quality fisheries habitat and to improve and protect water quality in the lake and in downstream Lake Washington that supplies potable water to the city of Melbourne. This will be accomplished by removing sediment from Lake Hell'n Blazes.

2 STUDY PURPOSE AND SCOPE

SUMMARY

The purpose of this study is to present a recommended plan for the aquatic ecosystem restoration of Lake Hell'n Blazes and the steps used to select a recommended plan. This Environmental Restoration Report (ERR) follows the guidelines of EC 1105-2-214, Project Modifications for Improvement of the Environment and Aquatic Ecosystem Restoration, dated 30 November 1997; EP 1165-2-502, Ecosystem Restoration – Supporting Policy Information, dated 30 September 1999; and ER 1105-2-100, Planning Guidance Notebook, dated 22 April 2000.

The alternatives analyzed for Lake Hell'n Blazes concentrated on sediment removal from the upstream (south) half or all of the lake. The alternatives, in conjunction with other planned projects in the Upper St. Johns River Basin, emphasized restoring hydrologic processes affecting Lake Hell'n Blazes that have been disrupted by agricultural development. Restoration of hydrologic processes is expected to allow the system to prevent re-accumulation of sediments.

LOCATION

Lake Hell'n Blazes is located in Brevard County, Florida, which is approximately midway down the Atlantic Coast of Florida. The study area is approximately 15 miles west of Melbourne or 45 miles southeast of Orlando. The lake is located in the central portion of the county, which is comprised of natural marshes and agricultural areas. The lake is

upstream (south) of Lake Washington which is a receiving point for its waters and the first large lake in the Upper St. Johns River Basin.

BACKGROUND

The St. Johns River is the longest river in Florida and one of only a few rivers in the Nation that flows north. The river has a 310-mile course and drains one-sixth of Florida (8700 square miles). The river flows from its headwaters in marshes near the project area, evolving into a series of lakes as it continues north. Lake Hell'n Blazes is the first lake within the headwaters of the St. Johns River. The lake is considered to be within the Upper St. Johns River Basin (USJRB).

The proposed project involves the aquatic restoration of Lake Hell'n Blazes that has been adversely impacted by high sedimentation, destruction of fish habitat, and degraded water quality conditions. Conditions within the lake have been declining since the 1960's. The lake is a part of the USJRB, itself a complex landscape of marshes, swamps, lakes and streams encompassing over 190,000 acres of wetlands. The USJRB is also important to migratory waterfowl and includes the 3870 acre T. M. Goodwin Waterfowl Management Area. The basin also serves as a rookery for various species. A separate USJRB Project is also in progress in the river basin. This project is a separate project from the proposed restoration and is discussed in Section 4.2.

Lake Hell'n Blazes was previously renowned for its excellent bass fishing. Agricultural encroachment now occupies more than 70% of the upper basin flood plain draining into Lake Hell'n Blazes (lake area = 258 acres) and has significantly impacted the lake's aquatic habitat and fisheries through sedimentation.

Existing habitat destruction resulting from high sedimentation of the upstream lakes has also resulted in adverse impacts on fish resources within Lake Washington (lake area = 4,362 acres and a potable water supply for City of Melbourne). Largemouth bass telemetry investigations conducted by the Florida Fish and Wildlife Conservation Commission (FWC) have determined that the Lakes Hell'n Blazes, Sawgrass, and Washington operate as a single fishery habitat. About 258 acres of game fish spawning area and habitat within Lake Hell'n Blazes have been lost to organic sediment and hydrilla infestation. The lake has acted as a catchment basin for flocculent organic materials arising from agricultural runoff and marsh detritus, including water hyacinth, water lettuce, tussocks (floating islands), and hydrilla. Lake Washington is being adversely impacted by this sedimentation. Data indicates that Lake Hell'n Blazes is at or near its capacity to contain sediments, and downstream sedimentation rates assessed for Lake Washington are steadily increasing. In 1992, during a high water event, large amounts of organic sediment and hydrilla moved downstream into Lake Washington from the upstream lakes. The high biological oxygen demand (BOD) created by this event led to the death of approximately 13,000 fish along the eastern shore of Lake Washington. Restoring the habitat of Lake Hell'n Blazes will provide a secondary benefit of reducing impacts to Lake Washington. At the recommendation of the FWC, SJRWMD requested restoration support from the Corps for Lake Hell'n Blazes in 1999. It should be noted that Lake

Hell'n Blazes is sometimes also referred to in the literature as Lake Hellen Blazes, Lake Hell'n' Blazes, Lake Hell N Blazes, and Lake Hell n' Blazes.

SUMMARY OF PROPOSED MODIFICATIONS

The proposed project would consist of the removal of approximately 0.98 million cubic yards of unconsolidated muck from the bottom of Lake Hell'n Blazes. This dredged material would be placed in a disposal area (DA) near the lake. The final disposal area is a 383 acre site bounded on the west by the Three Forks Levee at Canal 2 (C-2). Two foot high berms of in situ material would be constructed around the final disposal area as depicted in Figure 1a (page 35). See Figures 1a, 1b, and 1c (pages 35-37) for a depiction of proposed project features.

A total of three alternatives were under consideration and consisted of 1) Without Project, 2) Dredge the Upstream (South) Half of Lake Hell'n Blazes, and 3) Dredge All of Lake Hell'n Blazes. Due to the nature of the unconsolidated muck, partial dredging from either a depth or downstream area perspective will offer no relief to the fishery habitat. As the winds and currents move across the lake, the remaining muck would be redistributed over the newly cleaned lake bottom. Game fish such as largemouth bass and bluegill prefer a firmer substrate for optimal spawning habitat, and these conditions will not be restored unless the vast majority of the muck is removed from the system. Therefore, the only viable options are to remove the muck concentrating on the upstream half of the lake or cleaning all of the lake.

REPORT PARTICIPANTS AND COORDINATION

The U.S. Army Corps of Engineers, Jacksonville District had the primary responsibility of preparing this document. The local sponsor, the St. Johns River Water Management District (SJRWMD), was instrumental in providing information for this document. The Florida Fish and Wildlife Conservation Commission (FWC) also is supportive of the aquatic restoration. The U.S. Fish and Wildlife Service (USFWS) furnished the Fish and Wildlife Coordination Act Report, which was used to prepare the Environmental Assessment. The Florida Department of Environmental Protection (FDEP) has provided input on resources in the area.

The Jacksonville District will coordinate the restoration with several federal, state, and local agencies. These agencies include the USFWS, FDEP, and Florida State Historic Preservation Officer. Reports and findings will also be made available to the public.

3 PRIOR STUDIES, REPORTS, AND EXISTING WATER PROJECTS

Before 1960, Lake Hell'n Blazes was noted as one of the premier game fishing lakes in the state of Florida. Because of the excellent water quality in the watershed, a surface

water treatment plant was built in about 1960 on downstream Lake Washington. This plant continues to supply drinking water to the City of Melbourne.

A number of past and present county and SJRWMD actions have significantly slowed accumulation of muck in the lake, as will future actions. Starting in the 1970s, the SJRWMD began implementing a number of stormwater capital improvement projects in the watershed to protect the potable water supply originating from Lake Hell'n Blazes. In 1987, the Florida Legislature and Governor enacted into law the Surface Water Improvement and Management (SWIM) program to promote clean-up, restoration, and protection of Florida's water resources. The SJRWMD, as the state agency water resource leader in this region, subsequently identified and continues to identify stormwater runoff, inadequate rules, and lack of enforcement issues in order to improve water quality and awareness in accordance with the SWIM program. Also in the future, as discussed in Section 4.2, the concurrent sub-projects of the USJRB Project will build stormwater detention and treatment facilities for runoff before it enters the lake.

Today, agricultural areas occupy more than 70% of the basin draining into the lake. Lake Washington remains as one of only a few surface water supplies of drinking water in Florida and plant capacity is currently being upgraded by about 20% to 20 MGD. Upstream in Lake Hell'n Blazes, the by-products of growth have threatened its own productivity as well. As a result of runoff, sedimentation, and increasingly constricted circulation, fish productivity in the lake has decreased substantially and Lake Washington's water quality is threatened in the long term.

4 PLAN FORMULATION

4.1 EXISTING CONDITIONS

Lake Hell'n Blazes is classified as a Class I surface water of the State of Florida, able to be used for the supply of potable water. In contrast, typical recreational waters of the State are considered to be Class III waters. Water depths are shallow in the lake, with sediment having accumulated to several feet in depth. Lake Hell'n Blazes receives most of its freshwater from Canal 40 (C-40) to the east and the Deseret Ranch canal system to the west. Canal 40 has several outlet points from which water can move through the watershed, starting at its northernmost point where it is open-ended and from which water freely communicates with the watershed, to outlet points further south. The Deseret Ranch canal system connects with the watershed via the center and west prongs of the Three Forks within the headwaters. Runoff from agricultural and marsh areas, as well as flood and canal construction events, has caused the sedimentation over decades. With a number of stormwater improvements that have occurred or are in progress (as further discussed in Sections 3 and 4.2), sedimentation rate is expected to be reduced significantly in the lake. Sedimentation has resulted in destruction of about 258 acres of fish habitat and spawning areas in the lake. Data has shown largemouth bass populations in the lake to be too small. Electroshock data taken in the spring of the years 2000 through 2002 indicated the range of largemouth bass in Lake Hell'n

Blazes varied from 18 to 41 fish. Nearby St. Johns River data indicated a range from 155-204 fish. Also, counts of about 500 fish have been observed in a nearby lake unconnected to the St. Johns River. It is the opinion of the FWC that Lake Hell'n Blazes should have largemouth bass counts that are both higher in magnitude and closer to values of the St. Johns River. Besides establishing more natural substrate habitat conditions for game fish such as largemouth bass, area water quality will be improved by the proposed project through both physical stabilization of sediments and removal of nutrients present in the sediment.

The shoreline properties are vegetated by drained pasture land including cabbage palms (*Sabal palmetto*) and wax myrtle (*Myrica cerifera*), as well as marsh and swamp areas. Hydrilla (*Hydrilla verticillata*) often infests the lake and would be removed as a part of the project. Hydrilla biomass would be removed, but since hydrilla is present upstream, eventually hydrilla would reestablish. However, with the natural bottom native plants will have the chance to establish and compete with the hydrilla versus the present condition.

The Lake Hell'n Blazes area is home to a wide array of fish and wildlife. Fish within Lake Hell'n Blazes includes fresh water species, such as gar (*Lepisosteus spp.*), bowfin (*Amia calva*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), panfish (Centrarchidae), and black crappie (*Pomoxis nigromaculatus*) species. Wading birds and ducks inhabit the lake. Mammals and reptiles also inhabit the project area. Several threatened (T) and endangered (E) species are known to utilize Lake Hell'n Blazes, including bald eagles (*Haliaeetus leucocephalus*) and wood stork (*Mycteria americana*). Lake Hell'n Blazes lies within the habitat range of the West Indian Manatee (*Trichechus manatus*), although it may be too shallow for manatees to enter, as well as being blocked by a structure on Lake Washington.

Lake Hell'n Blazes' watershed has experienced agricultural development over the last 50 years. This growth, and its associated storm water drainage, has had significant adverse impacts on the historic hydrology, bottom substrate, and water quality. Specific problems have included nutrient loading, and elevated levels of pollutants and sediments entering the lake directly from stormwater discharges, or indirectly through open drainage ditches/canals. These drainage systems have also accelerated surface and subsurface discharge of freshwater into the lake.

4.2 FUTURE WITHOUT PROJECT CONDITIONS

This river basin is also the site of the Upper St. Johns River Basin Project which is a 2,000 square mile project constructed in partnership with the St. Johns River Water Management District. Planned improvements associated with the USJRB Project are depicted in Figure 1d (page 38). The project, now in progress, is a restoration of about 150,000 acres in the river's headwater marshes. Restoring marshes and more natural hydrologic

processes will allow better water quality and improved inputs to Lake Hell'n Blazes. The project also provides flood protection and recreation benefits. The USJRB Project is a separate project from the proposed restoration project on Lake Hell'n Blazes.

There are a number of sub-projects in the watershed that are part of the USJRB Project, including the Canal 1 (C-1) re-diversion and Three Forks Marsh Conservation Area sub-projects. The C-1 re-diversion sub-project seeks to detain and slowly release treated C-1 water coming from the City of Palm Bay. The City of Palm Bay is to the southeast of Lake Hell'n Blazes. From a canal connecting to C-1, a pumping system will discharge into the Sawgrass Lakes Water Management Area (SLWMA) that will in turn serve as a treatment wetland. The SLWMA is to be a near-2000 acre area that will allow for discharge of treated water to the St. Johns Marsh Conservation Area via a new spillway. With respect to the proposed project in this ERR, lake bottom sediment from the proposed aquatic restoration would be disposed of in what will become the SLWMA.

Also a part of the USJRB Project, the Three Forks Marsh Conservation Area (TFMCA) has been established to provide for flood control protection, environmental protection, and recreation for the watershed to about 12 miles south of Lake Hell'n Blazes. The original floodplain in this area was also negatively impacted by agricultural diking and draining of untreated stormwater. Levee construction will cut off old drainage canals through the near-14,000 acre TFMCA and releases to the river headwaters will be controlled in a more natural manner.

Most of the USJRB Project features will be operational within the next decade. With the USJRB and SWIM improvements, similar lake system sedimentation problems would not be evident for approximately 50 years. While these actions are necessary to restore the ecosystem, they are not sufficient to achieve full restoration. Lake Hell'n Blazes would still contain the sediments that have accumulated over the past 50 or more years. These sediments will continue to cover the hard spawning substrates required by and used by a wide variety of fish. They will continue to contribute to poor water clarity and high nutrient concentrations. Also as an additional detriment should the project not be implemented with the lake at or near sedimentation capacity, Lake Washington will be increasingly adversely impacted which in turn may affect the potable water supply for the City of Melbourne.

4.3 PROBLEMS AND OPPORTUNITIES

This valuable ecosystem consists of marshes, swamps, lakes and streams. The major problem in Lake Hell'n Blazes is that agriculturalization has dramatically increased the amount of sediments and nutrients in the lake. Sediments have covered the historic hard bottom and sandy areas in Lake Hell'n Blazes. Sediments are up to four feet deep in locations. The sediments in some areas reach so close to the surface of the water that they are exposed to the air on certain conditions. The lake is at or near capacity for sediment. As a result of the sediment and nutrient runoff, habitats for fish have been degraded or eliminated and populations of lake species have been reduced. Previously

the lake was noted as one of the premier fishing lakes in the state of Florida. Productivity of the fisheries has been seriously impacted by runoff. Spawning areas have been reduced. As previously discussed, a Lake Washington fish kill due to low dissolved oxygen levels has also resulted from this sedimentation and the water quality of Lake Washington will eventually be further adversely affected.

Stormwater runoff from the agricultural areas has contributed a significant amount of sediment and nutrients to Lake Hell'n Blazes. Improvements to runoff quantity and quality are included in the Without Project condition and stormwater runoff is not considered a problem to be addressed by this project. Efforts to reverse eutrophication due to agricultural runoff are vital to lake health.

Instead of diverse native aquatic vegetation, invasive and exotic hydrilla (*Hydrilla verticillata*) has on occasion covered about 90% of Lake Hell'n Blazes' lake bottom. Studies have determined that the detrimental effects of hydrilla outweigh any beneficial impacts, principally due to displacement of native vegetative species (Langeland, 1996). The hydrilla thereby reduces habitat value and is expected to do so in the future. This in turn will result in loss of historical fishery benefits, low dissolved oxygen conditions, and other adverse water quality conditions in the lake. Similarly, Lake Washington continues to be increasingly adversely affected as the problems move downstream. Though the project will remove the hydrilla seed bed present (tubers), hydrilla is present upstream and will eventually reestablish. However, natural habitat will allow native plants to establish and compete with the hydrilla versus the present conditions.

Diversifying the habitat by beneficially placing dredged material in a future wetland treatment area will potentially benefit wading birds, mammals, amphibians, and reptiles.

Project Problems:

- Soft sediments have been deposited in and filled Lake Hell'n Blazes.
- Hydrilla has infested the lake.
- Fish populations are small and their habitat is poor.
- Poor water quality has existed.

Project Opportunities:

- Lake Hell'n Blazes habitat can be improved for fish and wildlife.
- Sediment loading can be decreased in the lake.
- Removed lake sediment can be beneficially placed in a low topographic area of the SLWMA so as to establish conditions for a flag marsh and wetland treatment.

4.4 OBJECTIVES AND CONSTRAINTS

Planning objectives are the purposes of a study. They are what we are trying to achieve and give direction to the management measures and alternatives. Objectives

are based on the problems and opportunities. Constraints are factors that limit what can be done. They describe what we want to avoid doing.

Development of objectives for the aquatic ecosystem restoration of Lake Hell'n Blazes began in 1999 with meetings between the SJRWMD, Florida Fish and Wildlife Conservation Commission, Brevard County, Florida Department of Environmental Protection, U.S. Army Corps of Engineers and the Public. The objectives were developed to direct and focus efforts to solve the identified problems in Lake Hell'n Blazes. Stormwater discharge issues in the Lake Hell'n Blazes watershed are being addressed by the SJRWMD and Brevard County. These activities are well under way and are considered complete in the Without Project condition.

The U.S. Army Corps of Engineers is addressing problems associated with the sediments that are currently within Lake Hell'n Blazes and problems related to water quality within or caused by Lake Hell'n Blazes. The planning objectives for this aquatic ecosystem restoration study are listed as follows:

List of Planning Objectives:

- Restore fish habitat
- Create habitat for native, rooted emergent, submersed, and floating aquatic vegetation
- Improve and protect water quality (clarity, oxygen concentration, nutrient levels)
- Minimize exotic invasive species

List of Constraints:

- Financial capability of local partners to cost-share project construction
- Maximum total federal share of cost is \$5 million under this authority.
- No adverse impacts to Threatened and Endangered Species.

4.5 MEASURES

A management measure is a feature or activity that can be implemented at a specific place to address one or more planning objectives. Features are usually structural measures and usually require construction or assembly. Activities are usually nonstructural measures and often are actions, procedures, or policies that affect actions or procedures. A measure for the proposed restoration of Lake Hell'n Blazes was developed to meet at least one of the planning objectives and to avoid constraints. The measure is briefly described below. The approximate location of the measure is shown in Figures 1a and 1b.

Measure - Dredge Accumulated Sediments:

Approximately 980,000 cubic yards of material has accumulated above hard bottom and sandy areas in Lake Hell'n Blazes. This material would be dredged with its embedded hydrilla from the lake. Removal of the muck layer would open the firm peat or sand layer to colonization by desirable invertebrate populations to provide increased food for

wading birds and ducks. Approximately 258 acres of fish habitat would be restored. Fish sampling before and after would be performed to determine increases in sport and forage fish populations. Hydrilla infestation before and after would also be measured to determine the decrease achieved. The dredged material would be placed in a disposal site close to and northeast of Lake Hell'n Blazes.

The following table (Table 1) represents the management measures for this study and the planning objectives each measure is designed to address. Dredging sediments from the lake meets most of the planning objectives.

Table 1. Management measures and planning objectives. The symbol “++” represents a direct relationship and the symbol “+” represents an indirect relationship. The symbols do not represent the size or magnitude of the impact or benefit.

Objectives	Dredge sediments
Restore fish habitat	++
Create habitat for desirable native aquatic vegetation	++
Improve water quality	++
Minimize exotic invasive species	++

4.6 ALTERNATIVES

An alternative is a set of one or more management measures functioning together to meet one or more of the planning objectives. Some measures can stand alone as alternatives. Some measures cannot be implemented alone and must be combined with certain other measures in order to be implemented.

The study team considered several combinations of measures. Three of these alternatives were retained for detailed analysis. Some alternatives were eliminated early in the study process.

4.6.1 Alternatives Eliminated from Detailed Study

Drawdown and the extensive use of wheeled vehicles:

It was not desired to perform drawdown for the riverine lake because of its being in an area of undeveloped wetlands inaccessible to wheeled vehicles. Also, control structures do not exist near the lake and awaiting natural low water conditions to allow for dewatering is not feasible. Thus temporary blockages of the lake system or portions of the lake system were not studied. Rather, alternatives involving a hydraulic dredge floated to the lake, with sediment being slurried by pipeline to a nearby disposal site, were examined as the only viable ways to effect restoration.

Dredge only downstream portions of Lake Hell'n Blazes:

Based on the experience of the team's engineers and biologists, the only viable options entail removing muck from either the whole lake or the most upstream half of the lake due to the desire to lessen re-damage (re-sedimentation) to newly cleaned lake area.

Disposal area other than proposed area:

A disposal area north of the proposed disposal area was considered early in the project, but was eliminated due to the quality of the wetland habitat that would be detrimentally impacted.

4.6.2 Non-Structural Alternatives

Non-structural alternatives have already been performed in the form of Best Management Practices.

4.6.3 Alternatives Studied in Detail

1) Without Project. With the no Federal action alternative, there would not be a project implemented using Federal funds. There would be no dredging and no associated disposal of lake bottom material.

2) Dredge the Upstream (South) Half of Lake Hell'n Blazes. This alternative would consist of dredging and disposal associated only with the upstream (south) half of Lake Hell'n Blazes.

3) Dredge All of Lake Hell'n Blazes. This alternative would consist of dredging and disposal associated with all of Lake Hell'n Blazes.

4.7 EVALUATION OF THE EFFECTS OF ALTERNATIVE PLANS

This section of the report briefly describes the effects of each plan and compares them to the without project condition. Several reports describe effects and evaluate the alternatives: the Environmental Assessment (EA) prepared for this report and the Coordination Act Report prepared by the U.S. Fish and Wildlife Service. Refer to these appended reports for detailed descriptions of beneficial and adverse impacts.

4.7.1 Without Project

This alternative assumes no Federal action and also that other basin improvements are made separately as part of the USJRB Project. With this alternative, poor fisheries and habitat would continue as muck would not be removed from lake bottom area.

4.7.2 Dredging Upstream (South) Half of Lake Hell'n Blazes Alternative

Approximately 490,000 cubic yards of material would be removed from the lake. There would be a temporary decline in water quality while dredging is in progress. Water quality and odor would be improved once the sediments are removed from the system. There would be a temporary increase in noise during dredging. There would be a decrease of approximately 129 acres of mud flats with an equal amount of exposed hard bottom and sandy area after dredging. Water depth would also increase by up to four feet. Figure 2 (page 39) depicts depths of sediment in Lake Hell'n Blazes.

Some areas in the bottom of the lake would likely still contain sediments. The combination of different depths of water and hard and soft substrates would provide habitats for a greater number of fish and invertebrate species than the nearly uniform shallow depth and nearly continuous soft sediment substrate expected in the without project condition. Water depths in many parts of the lake would be sufficient for use by the largest freshwater fish. Hydrilla would be removed as part of the dredging. In summary, necessary habitat that has disappeared in the damaged headwaters would be restored in support of a wide variety of fish and wildlife, including rookeries, the wood stork, and bald eagle. This habitat restoration would also allow for increased native vegetation, reduced ecological risk and a decreased threat to downstream water supply.

4.7.3 Dredging All of Lake Hell'n Blazes Alternative

Approximately 980,000 cubic yards of material would be removed from the lake. There would be a temporary decline in water quality while dredging is in progress. Water quality and odor would be improved once the sediments are removed from the system. There would be a temporary increase in noise during dredging. There would be a decrease of approximately 258 acres of mud flats with an equal amount of exposed hard bottom and sandy area after dredging. There would be an increase of water depth of up to four feet in Lake Hell'n Blazes. Figure 2 (page 39) depicts depth of sediment in Lake Hell'n Blazes.

Some areas in the bottom of the lake would likely still contain sediments. The combination of different depths of water and hard and soft substrates would provide habitats for a greater number of fish and invertebrate species than the nearly uniform shallow depth and nearly continuous soft sediment substrate expected in the without project condition. Water depths in many parts of Lake Hell'n Blazes would be sufficient for use by the largest freshwater fish. Hydrilla would be removed as part of the dredging. In summary, necessary habitat that has disappeared in the damaged headwaters would be restored in support of a wide variety of fish and wildlife, including rookeries, the wood stork, and bald eagle. This habitat restoration would also allow for increased native vegetation, reduced ecological risk and a decreased threat to downstream water supply.

4.7.4 Screening of Alternatives

Policy requires the use of four screening criteria in the screening and evaluation of alternative plans. The criteria are acceptability, completeness, effectiveness, and efficiency.

Acceptability is the workability and viability of the alternative plan with respect to acceptance by State and local entities and the public and compatibility with existing laws, regulations, and public policies. One aspect of acceptability is whether the alternative is feasible or achievable with regard to technical, environmental, economic, social, or similar reasons.

Completeness is the extent to which an alternative plan includes and accounts for all necessary investments or other actions to ensure the realization of the planned effects.

Effectiveness is the extent to which an alternative plan contributes to the attainment of the planning objectives (alleviates problems and achieves opportunities). The most effective alternatives make significant contributions to all of the planning objectives. Less effective alternatives make smaller contributions to one or more of the alternatives. Effectiveness is a matter of degree rather than all or nothing.

Efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating problems and realizing opportunities, consistent with protecting the Nation's environment. It is a measure of allocation of resources. Cost-effectiveness is one common measure of efficiency. Both monetary and non-monetary costs are considered. Opportunity costs are also considered.

Table 2 summarizes the impacts of each alternative. The best plan in an environmental restoration project study is the plan that maximizes net benefits. Project outputs that are primarily environmental restoration are not expressed monetarily, as a matter of policy. Dollar values for project benefits and benefit/cost ratios are not present in the National Economic Development (NED) account because the benefits of the project are non-monetary. The alternative that maximizes net benefits is the alternative for which the difference between monetary and non-monetary costs and benefits is greater than for any other alternative. Benefits are expressed in the National Ecosystem Restoration (NER), Environmental Quality (EQ) and Other Social Effects (OSE) accounts.

Table 3 summarizes the contributions that each alternative addressed makes toward the restoration planning objectives. All alternatives make positive contributions to each objective. All alternatives avoid the planning constraints, relative to the Without Project Condition. Table 3 also presents the findings for the alternatives with respect to the four evaluation criteria.

Table 2. Summary evaluation of impacts of alternative plans.

PLAN DESCRIPTION	Without project condition	Dredging Dredge Upstream (South) Half of Lake Hell'n Blazes	Dredging Dredge All of Lake Hell'n Blazes
National Economic Development (NED)			
(1) Total Investment Cost	\$0	\$4,538,314	\$6,564,913
National Ecosystem Restoration (NER)			
(1) Acreage Dredged	0	129	258
(2) Cost per Acre	N/A	\$35,181	\$25,445
Environmental Quality (EQ)			
(1) Air/Noise	No change.	Temporary increased noise levels during construction.	Temporary increased noise levels during construction.
(2) Water Quality	Poor clarity, high nutrient levels, low oxygen levels.	Improve clarity, lower nutrient levels, increase oxygen levels. Water quality standards (turbidity) would be maintained during construction.	Improve clarity, lower nutrient levels, increase oxygen levels. Water quality standards (turbidity) would be maintained during construction.
(3) Threatened and Endangered Species	Poor fisheries and habitat, including for wood storks.	Increased fish production would benefit wood storks.	Increased fish production would benefit wood storks.
(4) Biological Resources	Poor fisheries and habitat.	Restore habitat. Increased production of game and forage fish, which would also benefit bird species.	Restore habitat. Increased production of game and forage fish, which would also benefit bird species.
(5) Cultural Resources & Historic Properties	No change.	No archeological or historical findings likely to be present.	No archeological or historical findings likely to be present.
(6) Wetlands	No change.	Improved lake wetland habitat. No net long term loss in SLWMA.	Improved lake wetland habitat. No net long term loss in SLWMA.
(7) Environmental Protection	No change.	All necessary measures would be taken to protect wetlands during construction.	All necessary measures would be taken to protect wetlands during construction.
(8) Manmade Resources/ Public Facilities and Services/ Tax and Property Values	No change.	No change.	No change.
(9) Aesthetic Values	No change.	No change.	No change.
(10) Quality of the Total Environment	Poor habitat and continued degradation of the environment.	All adverse environmental impacts would be minimized. Lake ecosystem would be enhanced with habitat restoration.	All adverse environmental impacts would be minimized. Lake ecosystem would be enhanced with habitat restoration.
Regional Economic Development (RED)			
(1) Regional or Community Growth	No significant effect.	No significant effect.	No significant effect.
Other Social Effects (OSE)			
(1) Life, Health and Safety	No significant effect or loss. Continued degradation of water resource.	Protect drinking water supply on Lake Washington.	Protect drinking water supply on Lake Washington.
(2) Community Cohesion	No significant effect.	No significant effect.	No significant effect.
(3) Recreation	No significant effect. Continued loss of recreation.	Increased boating access. Increased recreational fishing.	Increased boating access. Increased recreational fishing.
(4) Employment and Business	No significant effect.	Overall benefit to construction industry and related jobs.	Overall benefit to construction industry and related jobs.
(5) Farms	No significant effect.	No significant effect.	No significant effect.

Table 3. Plan evaluation.

PLAN DESCRIPTION	Without Project Condition	Dredging Upstream (South Half of Lake Hell'n Blazes) Dredge to hard bottom and sandy area	Dredging All of Lake Hell'n Blazes Dredge to hard bottom and sandy area
A. Contribution to Planning Objectives			
(1) Restore fish habitat.	No restoration. Continued degradation of fish habitat.	Meets objective by removing sediment and restoring lake depth.	Meets objective by removing sediment and restoring depth in lake.
(2) Create habitat for desirable native aquatic vegetation.	No restoration. Continued degradation of native aquatic vegetation habitat.	Meets objective by removing sediment and hydrilla.	Meets objective by removing sediment and hydrilla.
(3) Improve and protect water quality.	No restoration. Continued degradation of water quality.	Meets objective by providing improved clarity, lower nutrient levels, increased oxygen levels. Protects Lake Washington water quality also.	Meets objective by providing improved clarity, lower nutrient levels, increased oxygen levels. Protects Lake Washington water quality also.
(4) Minimize exotic invasive species.	No restoration. Continued degradation of lake aquatic environment due to exotics.	Meets objective by removing hydrilla.	Meets objective by removing hydrilla.
B. Response to Planning Constraints			
(1) Financial capability of local partners to cost-share project construction.	N/A	Meets constraint.	Meets constraint.
(2) Federal share \$5 million or less	N/A	Meets constraint.	Meets constraint.
(3) No adverse impacts to endangered species	N/A	Meets constraint.	Meets constraint.
C. Response to Evaluation Criteria			
(1) Acceptability	Not acceptable.	Acceptable.	Acceptable.
(2) Completeness	N/A	Complete.	Complete.
(3) Effectiveness	Does not meet objectives.	Meets objectives.	Meets objectives.
(4) Efficiency	N/A	Efficient.	Efficient.
(5) Overall Public Interest	Does not serve public interest.	Serves public interest.	Serves public interest.

4.8 COMPARISON OF ALTERNATIVES

This section presents comparisons of the alternatives with each other. It demonstrates the additional benefits that are obtained for additional increments of dredging. The primary evaluation of alternatives with respect to the Without Project Condition is presented in Section 4.7.

4.8.1 Comparisons

All alternatives – Dredging and Additional Dredging – would generate the same initial substrate changes in the project area of Lake Hell'n Blazes. Approximately 980,000 cubic yards of material would be removed from the lake. There would be a decrease of 258 acres of mud flats in the lake. There would be an increase of up to four feet in the depth of Lake Hell'n Blazes.

Table 4 summarizes the study team's comparisons of the alternatives. It displays the rank assigned to each alternative for its contribution to each of the Planning Objectives. The rank of 1 was assigned to the alternative that best meets each objective. A professional interdisciplinary team of planners, engineers, and scientists conducted this comparison.

Table 4. Comparison of Alternatives. Rank 1 is best, 3 is least.

Alternatives	Without Project Conditions No Restoration	Dredging Upstream (South) Half of Lake Hell'n Blazes	Dredging All of Lake Hell'n Blazes
Relative Contribution to Planning Objectives			
(1) Restore fish habitat.	3	2	1
(2) Create habitat for desirable native aquatic vegetation.	3	2	1
(3) Improve and protect water quality.	3	2	1
(4) Minimize exotic invasive species.	3	2	1

The best plan in an environmental restoration project study is the plan that meets the same general optimization criterion as in a traditional water resources development project whose primary or sole purpose is not environmental restoration. That criterion is maximization of net benefits. The alternative that maximizes net benefits is the alternative for which the difference between monetary and non-monetary costs and

benefits is greater than for any other alternative. Benefits and costs for an alternative are the estimated differences between relevant conditions with and without the alternative.

Cost effectiveness combined with incremental costs analysis is a valuable tool in the decision making process of determining the alternative with the largest net benefits. There should be no other plan that accomplishes the same outputs at less costs, no other plan that costs the same and produces more outputs, or any combination of these two scenarios. For the Lake Hell'n Blazes aquatic restoration project, all benefits are non-monetary environmental improvement benefits.

A cost effective/incremental cost analysis issue worth addressing is whether it would be more beneficial to just restore the upstream (south) half of Lake Hell'n Blazes as opposed to restoring all of Lake Hell'n Blazes. Just dredging the downstream (north) half of Lake Hell'n Blazes would greatly diminish if not fully eliminate environmental restoration benefits, and would make it easy for the remaining exotic invasive vegetation and sediment to spread to the dredged areas, yielding much greater long term costs with notably reduced benefits. This alternative was eliminated early in the planning process due to not meeting the projects objectives, so an incremental analysis of these alternatives was not necessary.

4.8.2 Cost Effectiveness and Incremental Analysis

Incremental analysis involves the valuing all habitat into units to be assigned to the various alternatives for comparison. A weighting scale of 0-1 was established to make the different habitat units combinable per acre. The Incremental Analysis was based on a Habitat Quality Index (HQI) outlined in IWR Report 91-R-1. The Index is assigned by the project biologist derived from data based on field investigations, literature, and historical information about the project site. Factors considered in rating alternatives include, but are not limited to vegetation, fish and wildlife resources, water quality, recreation, protected species, and public importance. Table 5 includes a description of the habitat units created by both of the Alternatives aimed at restoring Lake Hell'n Blazes.

Table 5. Habitat Unit Evaluation

Alternative	Size of area impacted	Rated Habitat	Habitat Value	Habitat Created
1. No Action	258 acres	.1	25.8	0
2. Dredging Upstream (south) Half of Hell 'n Blazes	258 acres*	.5	129.0	103.2
3. Complete Dredging of Hell 'n Blazes	258 acres	.9	232.2	206.4

*Although approximately 129 acres of lake bottom would be dredged in this alternative, the entire lake (258 acres) would have some level of redistribution of the remaining material.

In a cost effectiveness analysis, the goal is to filter out plans that produce the same output level as another plan, but cost more; or cost either the same amount or more than another plan, but produces less output. The plans are listed in order of increasing output; this imposes order and facilitates cost effectiveness analyses.

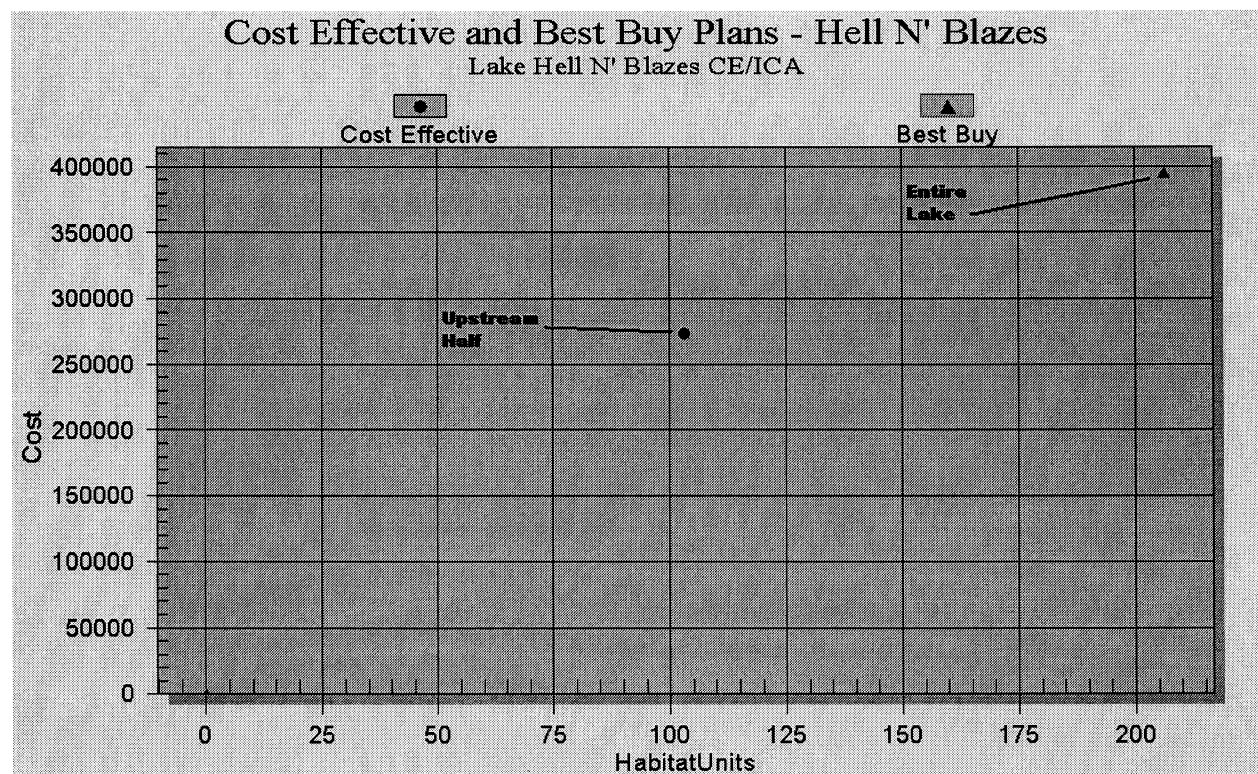
The following three cost effective logic statements hold true for these alternatives:

1. *The same output level could be produced by another plan at less cost;*
2. *A larger output level could be produced at the same cost; or*
3. *A larger output level could be produced at less cost.*

Table 6. Cost and Habitat Unit Value Output of Alternatives

Alternative	Annual Cost	Habitat Units	Cost/Output
Upstream Half	\$272,972	103.2	\$2,645
Entire Lake	\$394,869	206.4	\$1,913

Chart 1. Cost Effective Plans Graphed



Both of the alternatives meet the criteria of cost effectiveness, as seen in Chart 1, but a selection must be made from among these plans. Because these plans produce different levels of output, choosing from among them is making an output level selection. Choosing an output level is choosing the scale of the project. While total annual cost information is useful for screening out non-cost effective plans, in most cases, it should not be used as the basis for output level selection. If minimizing average annual costs were the decision criteria, decisions would be made on the basis of cost alone and would overlook the important question of “*is this level of output worth it?*” If the answer is “Yes”, perhaps then plans with higher average annual costs but produce more output are also “worth it”. If costs alone were the only factor, the alternative with the lowest cost would be selected, but there are other factors to consider in the decision making process, including the level of output desired.

Looking at Table 6 it can be seen that Alternative 1 dredging only the upstream half of Hell’n Blazes contains the least average annual cost. A common misconception is that the plan (and thus the output level) that minimizes average costs (or, in other words, is most efficient in production) is chosen. Such rationale for decision-making is incomplete. In most environmental planning applications, looking at incremental cost information can facilitate decisions regarding the selection of output level. Incremental costs analysis provides for the explicit comparison of the relevant changes in costs and outputs on which decision criterion may be based, but does not explicitly give which one alternative is the best.

Referring to Table 7 and Chart 2, it can be noted that IWR-PLAN, an authorized Army Corps of Engineers incremental analysis tool, specifies only one Alternative worth examining: dredging the entire lake. This Alternative is considered the “best buy”. “Best buys” are the most efficient plans at producing the output variable - they provide the greatest increase in the value of the output parameter variable for the least increase in the value of the cost parameter variable. The first “best buy” is the most efficient plan, producing output at the lowest incremental cost per unit. If a higher level of output is desired than that provided by the first “best buy”, the second “best buy” is the most efficient plan for producing additional output, and so on.

Table 7. Best Buy Plan

Alternative	Annual Cost	Average Cost	Incremental Cost	Incremental Output Habitat Units	Incremental Cost Per Output
Entire Lake	\$394,869	\$1,913	\$394,869	206.4	\$1,913

Chart 2. Best Buy Plan



It can be seen that the entire lake dredging is the most efficient plan (best buy). This does not mean that this plan is automatically the recommended plan.

4.9 SELECTED (RECOMMENDED) PLAN

The dredging of all of Lake Hell'n Blazes alternative appears to meet the planning objectives of ecosystem restoration of the lake. This alternative produces permanent benefits when coupled with other basin initiatives. While this alternative is more costly, it yields greater output and is less costly per acre than just restoring the upstream (south) half of Lake Hell'n Blazes. In view of the issues outlined during the comparison of the alternatives, a team of professional multi-disciplined scientists and planners concluded that restoring all of the lake is the environmentally best and economically most cost efficient way to achieve the proposed ecosystem restoration of Lake Hell'n Blazes.

5 DESCRIPTION OF THE SELECTED PLAN

5.1 PLAN FEATURES

The dredging of all of the lake plan consists of several components, including pipeline dredging and permanent disposal. The components are further discussed in the following paragraphs.

About three months prior to lake work, the Sponsor should coordinate spraying the lake for hydrilla if required. This can be done by contacting DEP's Bureau of Invasive Plant Management (BIPM). It should be noted that the lake has already been treated with a herbicide in the first half of 2002 during low water conditions. Such treatment would degrade the hydrilla, remove the vegetative growth (if present), but would leave the underground reproductive structures called tubers that may extend to about 11 inches into bottom material. Lake shoreline vegetation, tussocks (floating islands), islands, floating water hyacinths, and floating water lettuce are not to be removed or harvested during the project and are to be avoided during the dredging. Floating plant treatments should also be coordinated with DEP's BIPM as needed. Work would also consist of a cutter dredge with a hydraulic pipeline removing a total of about 0.98 million cubic yards of bottom material. To minimize sediment redistribution in the event sediment volumes or costs limits are reached and dredging is terminated, the lake should be dredged in sections. A sample order of sections is provided as Figure 3 (page 40). Volume estimates for the lake were provided by the Sponsor and were obtained by determining the thickness of sediment above lake bottom. Lake bottom was determined using a tube being driven by a sledge hammer to point of refusal in silty clay. Sediment thickness information was coupled with bathymetric information to provide volume estimates and the sediment thickness contours shown in Figure 2 (page 39). Limited sampling of the lake's sediment has indicated a bulk sediment density of about 0.177 g/cc (water content 78.533%) in Lake Hell'n Blazes. Volatile solids were measured at 40.63%. Shoreline conditions consist of wetland buffer vegetation. USGS gauge 0223200 upstream of the Highway 192 bridge indicates a nominal flow range from 167 cubic feet per second in May to 1668 cubic feet per second in October. Recorded level readings vary from less than one foot, to just over seven feet. During a 23 July 2002 site visit, the level at the gauge was at about 6.2 feet. Extraordinary measures to control water quality may be required as part of the work, both to comply with permit requirements and to ensure that Lake Washington is protected. These measures may include, but are not limited to, flocculent injection into the disposal site slurry, flocculent injection in the water column for plume control at the point of the dredge, and turbidity and floating debris barriers.

The dredged material would be pumped to a disposal area located northeast of the lake. The dredge pipeline is expected to be a polyethylene pipe. To install and remove the piping with minimal disturbance to wetlands, low impact ground pressure equipment would be used. The pipeline path depicted in Figures 1a and 1c represent a layout from the lake to the closest easterly levee. Other possible pipeline layouts might include a

tram that runs between the easterly levee to a point near Little Lake Sawgrass. For its western boundary, the disposal site would use the existing levee along C-2. Two foot high berms of in situ material would be constructed around the final disposal area as depicted in Figure 1a. Material would be pumped from the lake to the northwest corner of the disposal site as depicted in Figure 1c. A weir with an adjoining sump area would be installed at the southwest corner of the disposal site. Weir released effluent would be pumped from the sump to C-40. During disposal operations, maintenance within the disposal area should allow for remounding and rerouting of water should the need arise (for example, to prevent short circuiting or other water quality problems). Excess waters would then eventually return to the headwaters of the watershed as described in Section 4.1.

The disposal area lies within an area of wetlands previously used as pasture land that, when filled, will no longer be suitable for agricultural use. The design of the disposal area is such that it will be part of the reflood area of the Sawgrass Lake Water Management Area. The topology of the current disposal site is such that lake material beneficially placed within the area will elevate the site so that it may be later used as a wetland treatment area. The conditions needed for a flag marsh wetland treatment area within the reflooded SLWMA will thus be aided by the proposed project. Testing of lake sediment has revealed no concerns over heavy metals or pesticides that would preclude the dredged material from being placed in the disposal site. As depicted in Figure 1a, vehicular access to the disposal site would be either from Highway 192 or from the C-1 access road. Another access to the disposal site might be using Highway 514 and constructing a temporary bridge over C-1. It is assumed that SLWMA surveys of the disposal area will be available for plans and specifications. It is important that disposal activities (including berm, weir, sump, and pump removal) be completed before reflooding of the SLWMA.

Contractually, cost protections should be observed on the project as follows. Mechanical removal and disposal of aquatic vegetation prior to dredging operations may be necessary should the contractor elect to use a small dredge(s) that cannot transport vegetative material without clogging. It will also be important that the dredging contractor develop an acceptable way to determine volumes placed in the disposal area including sediment volumes and detritus volumes. This will allow for monitoring of project progress, control of costs, and payments to the contractor. The contractor should also submit a plan to accomplish sectional dredging of the lake.

In summary, the proposed project will restore a degraded ecosystem to one with more natural integrity, productivity, stability, and biological diversity. This is the recommended plan as it provides the maximum net benefit when considering monetary and non-monetary effectiveness. The recommended plan is also the locally preferred plan.

5.2 PLAN COSTS

A standard U.S. Army Corps of Engineers computer program, M-CACES, was used to calculate the construction cost estimate for the proposed Lake Hell'n Blazes Ecosystem Restoration Project. The M-CACES output is provided in Appendix B. Construction costs do not include the related non-construction costs of permit acquisition, design, bid process, associated surveys, and project management. The current estimated cost of construction is shown in Table 8. The current estimated costs of construction and non-construction activities are combined in Table 9.

Economic Evaluation of Costs

Engineering Regulation (ER) 1105-2-100 (Planning Guidance Notebook) provides economic evaluation procedures to be used in all Federal water resources planning studies. The guidelines specified in ER 1105-2-100 dated 22 April 2000 were observed in preparing this report. The Federally mandated project evaluation interest rate of 5.625 percent, an economic period of analysis of 50 years, and 2003 prices were used to evaluate economic feasibility.

The main issues requiring economic evaluation attention include equivalent time basis calculations, price levels, timing of project spending, and computation of average cost. The timing of a plan's cost is important. Construction and other initial implementation costs cannot simply be added to periodically recurring costs for project operation, maintenance, and monitoring. Also, construction costs incurred in a given year of the project cannot simply be added to construction costs incurred in other years if meaningful and direct comparisons of the costs of the different alternatives are to be made. A common practice of equating sums of money across time with their equivalent at an earlier single time point in time is the process known as discounting. Through this mathematical process, which involves the use of an interest rate (or discount rate) officially prescribed by Federal policy for use in water resources planning analysis (currently set at 5.625% per year), the cost time streams of each alternative are mathematically translated into an equivalent time basis value.

Table 8. Estimated cost of construction.

Item	Cost	Cost with contingency
Pre and post fish population and hydrilla infestation sampling	\$20,000	\$25,000
Cultural resource review	\$25,000	\$30,000
Mobilization/Demobilization	\$227,400	\$261,500
Dredging – Mechanical/Pipeline	\$2,989,000	\$3,437,400
Disposal Area and Associated General Items	\$731,800	\$841,600
Construction Management	\$335,600	\$385,900

Table 9. Total project cost estimate.

Item	Estimated Cost	Estimated Cost With Contingency
Study Cost	\$113,235	\$113,235
Permit Acquisition	\$12,500	\$15,000
Real Estate Planning	\$32,000	\$40,000
Lands and Damages	\$878,262	\$1,097,827
Plans and Specifications	\$189,600	\$218,000
Bid Process	\$20,000	\$25,000
Construction (from Table 8)	\$4,328,800	\$4,981,400
Total Project Cost Estimate	\$5,574,397	\$6,490,462

ER 1105-2-100 requires that interest during construction (IDC) be computed which represents the opportunity cost of capital incurred during the construction period. Interest was computed for construction cost from the middle of the month in which the expenditures were incurred until the first of the month following the estimated 6-month construction period. The cost of a project is investment incurred up to the beginning of the period of analysis. The investment cost at that time is the sum of construction and other initial cost such as real estate and PED cost plus interest during construction. Table 10 as follows summarizes the total investment cost and total annual equivalent costs for each alternative plan.

Table 11 provides summary information on Florida freshwater lake restoration projects. Benefit and cost estimates tend to vary from project to project depending on many items including scope of restoration (such as the amount of muck removal, plantings, lake drawdown/non-drawdown, or other project unique features), real estate costs, archeological significance of an interior lake(s), and other parameters. It should be noted that lake restoration efforts are relatively new and that costs should become more precise as project experience and efficiencies are gained over time.

Table 10. Total Investment Cost and Total Annual Equivalent Costs

Summary of Costs	Dredge Lake Hell'n Blazes	Dredge Upstream Half of Lake Hell'n Blazes
Initial Construction	\$4,981,400	\$2,982,400
PED and Admin	\$411,235	\$411,235
Interest during Construction	\$74,451	\$46,852
Land and Damages	\$1,097,827	\$1,097,827
Total Investment	\$6,564,913	\$4,538,314
Annual Costs:		
Interest and Amortization	\$394,869	\$272,972
O&M Costs	\$0	\$0
Total Annual Costs	\$394,869	\$272,972
Assumptions:		
Construction cost is evenly distributed over 6 months.		

Table 11. Lake Restoration Projects (Benefits and Costs)

	Lake Trafford (Collier County)	Lake Osborne (Palm Beach County)	Lake Hell'n Blazes (Brevard County)
Acres	1500	125	258
Estimated Cost	\$30.0M	\$3.0M	\$6.5M
Cost per Acre	\$20,000	\$24,000	\$25,200

5.3 RISK AND UNCERTAINTY

A risk and uncertainty evaluation has been conducted to characterize and address issues of risk and uncertainty inherent in the planning, design, and implementation of the lake restoration recommended plan. The ultimate performance of the plan is contingent on many factors, including a time lag between implementation of the restoration and the ecological response of the lake. Planning, design and implementation uncertainties are discussed in the following paragraphs.

A planning phase 15% cost contingency has been utilized in Appendix B projections of Plans and Specifications and Construction costs. During the design phase, it is possible that additional survey and mapping data will be required, with additional time required to complete a more detailed design. However, new tasks are not anticipated that would increase the overall project cost or delivery date.

The basis for volume estimates and associated costing is "Sediment Volumes for Lake Sawgrass and Hell'n Blazes," St. Johns River Water Management District, dated December 2, 1992. Uncertainties associated with the volume of material to be removed could affect the projected output for the cost. There is uncertainty with the firmness of the substrate and it has been assumed that the ground is firmer below the muck. Close monitoring of dredging volumes during construction has been recommended so as to minimize the risk of cost overruns.

In a scenario where lake sediment volumes were underestimated, a larger level of restoration work could result in a lower projected output (less lake bottom restored) for the cost if the project were prematurely terminated to avoid a cost overrun. Thus, a smaller scope effort, say half lake dredging, could have lower costs for the output. On the other hand, higher costs for the output could result from half lake mobilization costs on the order of those of the whole lake dredging alternative. To help reduce the uncertainty with output attainment inherent with a larger scope of work, the assumption has been made that a sectional dredging technique (see Figure 3) would be utilized whereby upstream lake areas are dredged first. The sectional technique should mitigate uncertainty related to output and associated cost being less or more in one plan over another in the event of premature project termination. Should work be terminated while in the process of dredging the last several lake sections, the project should still be a success in regards to costs and restoration benefits and would not be a deficient design. However, project benefits will be maximized if all lake sections are dredged.

Uncertainties associated with the character of material to be dredged could affect projected costs. Limited information was available concerning the composition of the material to be dredged. It was also assumed that the dredge slurry would include hydrilla tubers. To lessen the possibility of turbidity delays adding to project costs, several design features and construction recommendations have been provided. The disposal site would be a large area with shallow depth and would have a maximum physical separation from the slurry discharge to the weir and adjacent sump. Also, precautions have been recommended with costs estimated for the use of flocculants.

Further, early permitting action on turbidity (and also wetland issues discussed in the following paragraph) has been recommended. Additionally, at the dredge and disposal sites, close monitoring of turbidity has been recommended during construction.

Difficulties are not anticipated with regard to project land acquisition, certification, or easement attainment. It should be noted that wetland mitigation costs have not been assumed in project cost projections. This has been assumed since the disposal site is shown on other project maps as being a future wetland treatment area and the dredged material would aid in establishment of the proper topography for the future reflooded wetland treatment area.

In conclusion, risks and uncertainties associated with the possible restoration have been examined. Provisions to reduce risk and uncertainty have been incorporated into this planning document. Monitoring and adaptive assessment strategies will continue to evaluate and address issues pertaining to design and construction. Such evaluations will continue to reduce uncertainties and increase the likelihood for overall success.

6 PLAN IMPLEMENTATION

6.1 NON-FEDERAL RESPONSIBILITIES

The responsibilities of the non-Federal sponsor are as follows:

- a. Pay 100 percent of any operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) costs attributable to the Ecosystem Restoration. Lake Hell'n Blazes itself is expected to be self-sustaining after the restoration actions are complete, and no costs are expected. The disposal area to the northeast of Lake Hell'n Blazes would be utilized.
- b. Provide all additional lands, easements, rights-of-way, borrow areas, and dredged material disposal areas; perform all relocations determined by the Government to be necessary for the Ecosystem Restoration; and provide evidence to support the Local Sponsor's legal authority to grant rights-of-entry to such lands. The necessary lands, easements and rights-of-way determined by the Government to be necessary for work to be performed under a construction contract must be furnished prior to the advertisement of the construction contract.
- c. Provide or pay to the Government the cost of providing all retaining dikes, weirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged material disposal area necessary for the Ecosystem Restoration.
- d. Comply with applicable provisions of the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, Public Law 91-66, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Act

100-7); the Uniform Regulations contained in 9 CFR Part 2, in acquiring lands, easement, and rights-of-way for construction and subsequent operation and maintenance of the Ecosystem Restoration; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

e. Provide, during the period of implementation, cash payments to meet its obligations under Article II of the Project Cooperation Agreement (PCA). Study cost and Plans and Specification costs will be funded up front by the Federal Government. Total Ecosystem Restoration costs will be reapportioned during the implementation period to meet the cost-sharing requirements.

6.2 OPERATION AND MAINTENANCE

Operations and maintenance costs are not expected post-restoration. The components of the Lake Hell'n Blazes aquatic ecosystem restoration are expected to be self-sustaining. The Upper St. Johns River Basin project, when completed with the construction of the Sawgrass Lake Water Management Area (SLWMA), will be responsible for maintenance of the proposed disposal area. Another dredging cycle is not anticipated over the life of the project because of the SLWMA. Currently, the state expends about \$500,000 annually to maintain the exotic vegetation for Lakes Hell'n Blazes and Sawgrass and this cost is expected to remain the same over the life of the project.

6.3 REAL ESTATE REQUIREMENTS

The study area and disposal site are owned by the sponsor. The sponsor intends to use the disposal land for the non-Federal share of the project costs. The sponsor would be responsible for obtaining easements for the use of the temporary disposal area and access road. A real estate appendix (Appendix A) has been provided with this report.

6.4 WORK IN KIND

The sponsor has identified no tasks to perform.

6.5 COST SHARING

Authority for the items of local cooperation and provisions of the Project Cooperation Agreement (PCA) is provided by Section 206 of the Water Resources Development Act of 1996, as amended. This project will be constructed solely for the purpose of aquatic ecosystem restoration in Lake Hell'n Blazes. On this basis, the Federal Government would bear 65 percent of the total habitat improvement costs at Lake Hell'n Blazes and the local sponsor would bear 35 percent. The total project cost estimate, \$6,490,462

includes cost of the feasibility study, engineering and design, plans and specifications, and construction. The Federal portion of the project cost is estimated to be \$4,218,800 and the non-Federal share is estimated to be \$2,271,662. Table 12 shows a simple partitioning for each of the costs.

The Environmental Restoration Report and Plans and Specifications are initially Federally financed, and costs distributed as part of the non-Federal share of project costs during implementation, so Table 9 does not represent the actual payments from the non-Federal sponsor. The sponsor (SJRWMD) requirements are indicated in Table 13. The sponsor will provide all lands, easements, rights-of-way, relocation, and dredge material placement areas (LERRD) required for the project. The remaining portion of the sponsor's share will be comprised of cash. The sponsor would be required to assume operations, maintenance, repair, rehabilitation, and replacement (OMRR&R) costs for the project after construction.

Table 12. Cost Sharing.

Item	Total Cost	Federal Share	Non-Federal Share
Study	\$113,235	\$73,603	\$39,632
Permit Acquisition	15,000	9,750	5,250
Real Estate Planning	40,000	26,000	14,000
Lands, Easements, Right of way, Relocations and Disposal areas (LERRD)	1,097,827	0	1,097,827
Plans and Specifications	218,000	141,700	76,300
Bid Process	25,000	16,250	8,750
Construction	4,981,400	3,951,497	1,029,903
Total	\$6,490,462	\$4,218,800	\$2,271,662

Table 13. Non-Federal Responsibility.

ITEM	COST
LERRD	\$1,097,827
Cash	\$1,173,835
Work-in-kind*	\$0
Annual OMRR+R	\$0

*Work-in-kind includes: None

7 LIST OF PREPARERS

7.1 PREPARERS

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Mike Viessman, Geotechnical Engineer, USACE
Erwin Wunderlich, Environmental Engineer, USACE

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Bruce Tappmeyer, Construction-Operations Mechanical Engineer, USACE
A'licia Scott, Civil Engineer, USACE
Paul Stodola, Biologist, USACE
Russ Weeks, Chief, Hydrologic Investigations Section, USACE

8 SUMMARY OF COORDINATION, PUBLIC VIEWS, AND COMMENTS

The Jacksonville District has been a regular participant in the periodic Lake Hell'n Blazes and Lake Sawgrass Task Force meetings. Interagency Task Force members include the Florida Fish and Wildlife Conservation Commission, St. Johns River Water Management District, Brevard County, and the Florida Department of Environmental Protection (FDEP). It will be important to continue coordination with these agencies - in particular, ensuring that FDEP is aware of lake and disposal area benefits as permitting

is pursued. Early permitting action should include asking for a variance to 1000 yards on the mixing zone for turbidity sampling.

The Jacksonville District and the SJRWMD (non-Federal sponsor) have been in close coordination during the preparation of the ERR. The Sponsor has reviewed and commented on earlier draft versions of the report. The Draft ERR and EA have been made available to the public.

The recommended plan appears to be in the best overall public interest and is the most beneficial environmental plan for implementation. There will be substantial benefit to fish and wildlife resources by restoring and creating lake bottom habitat that will provide a firmer natural substrate that would facilitate spawning of game fish such as largemouth bass and bluegill. Water quality will also be improved with the removal of lake muck, both to the lake itself and also to downstream water resources.

This plan meets the designated criteria for participation by the Federal Government for aquatic ecosystem restoration. There are no identified plans more cost efficient that address the planning objectives and achieve significant aquatic ecosystem restoration for the lake. The impacts of the proposed project are deemed beneficial overall and the plan is considered to be in full compliance with all pertinent environmental statutes as well as other Federal laws and directives regarding water resource project development.

9 RECOMMENDATIONS

I have weighed the accomplishments to be obtained from the proposed ecosystem restoration on Lake Hell'n Blazes in Brevard County, Florida, against project costs and considered the alternatives, impacts, and scope of the proposed project. In my judgment, the proposed project is a justified expenditure of Federal funds. I recommend that the Secretary of the Army approve the Section 206 Lake Hell'n Blazes Environmental Restoration Report. The total estimated cost of the project is \$6,490,462 (of which \$4,218,800 would be Federal cost according to Section 206(b) of Public Law 104-303). The remaining \$2,271,662 would be non-Federal funds provided by the St. Johns River Water Management District. I further recommend that funds be allocated in the fiscal year 2004 to initiate preparation of plans and specifications.

The above recommendations are made with the provision that prior to project implementation, the non-Federal sponsor shall enter into a binding agreement with the Secretary of the Army or his designated representative to perform the following items highlighted in the Project Cooperation Agreement:

- a. Provide all land, easements, and rights-of-way, and suitable borrow and dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the implementation, operation, and maintenance of the Project;
- b. Provide all improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the implementation, operation maintenance of the Project;
- c. Provide, during implementation, any additional amounts as are necessary to make its total contribution equal to 35 percent of the project environmental restoration costs;
- d. For so long as the Project remains authorized, operate, maintain, repair, replace, and rehabilitate the completed Project, or functional portion of the Project, at no cost to the Federal Government, in a manner compatible with the Project's authorized purposes and in accordance with applicable Federal and State Laws and regulations and any specific directions prescribed by the Federal Government;
- e. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor, now or hereafter, owns or controls for access to the Project for the purpose of inspection, and, if necessary after failure to perform by the non-Federal sponsor for the purpose of completing, operating, maintaining, replacing, or rehabilitating the Project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Federal Government shall operate to relieve the non-Federal sponsor of responsibility to meet the non-Federal sponsor's obligations, or to preclude the Federal Government from pursuing any other remedy at law or equity to ensure faithful performance;

- f. Hold and save the United States free from all damages arising from the implementation, operation, maintenance repair, replacement, and rehabilitation of the Project and any Project related betterment, except for damages due to the fault or negligence of the United States or its contractors;
- g. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Project in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Sections 33.20;
- h. Perform, or cause to be performed, any investigations for hazardous substances as are deemed necessary to identify the existence and extent of hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the implementation, operation, and maintenance of the Project, except for any such lands, easements, or rights-of-way that are owned by the United States and administered by the Federal Government, and except for any such lands that the Federal Government determines to be subject to the navigation servitude. The Government shall perform, or cause to be performed, all investigations on lands, easements, or rights-of-way that are owned by the United States and administered by the Federal Government. For lands that the Federal Government determines to be subject to navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;
- i. Assume complete financial responsibility, as between the Federal Government and the non-Federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the implementation, operation, or maintenance of the Project Modification, except for any such lands, easements, or right-of-way owned by the United States and administrated by the Federal Government;
- j. As between the Federal Government and the non-Federal sponsor, the non-Federal sponsor shall be considered the operator of the Project for the purpose of CERCLA liability. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the Project in a manner that will not cause liability to arise under CERCLA;
- k. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for the implementation, operation, and maintenance of the Project, including those necessary for relocation, borrow materials,

and dredged or excavated material disposal, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

l. Comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C.2000d), and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army", and the Davis-Bacon Act and other labor standards provisions;

m. Provide 35 percent of that portion of total historic preservation mitigation and data recovery costs attributable to the Project that are in excess of one percent of the total amount authorized to be appropriated for the Project;

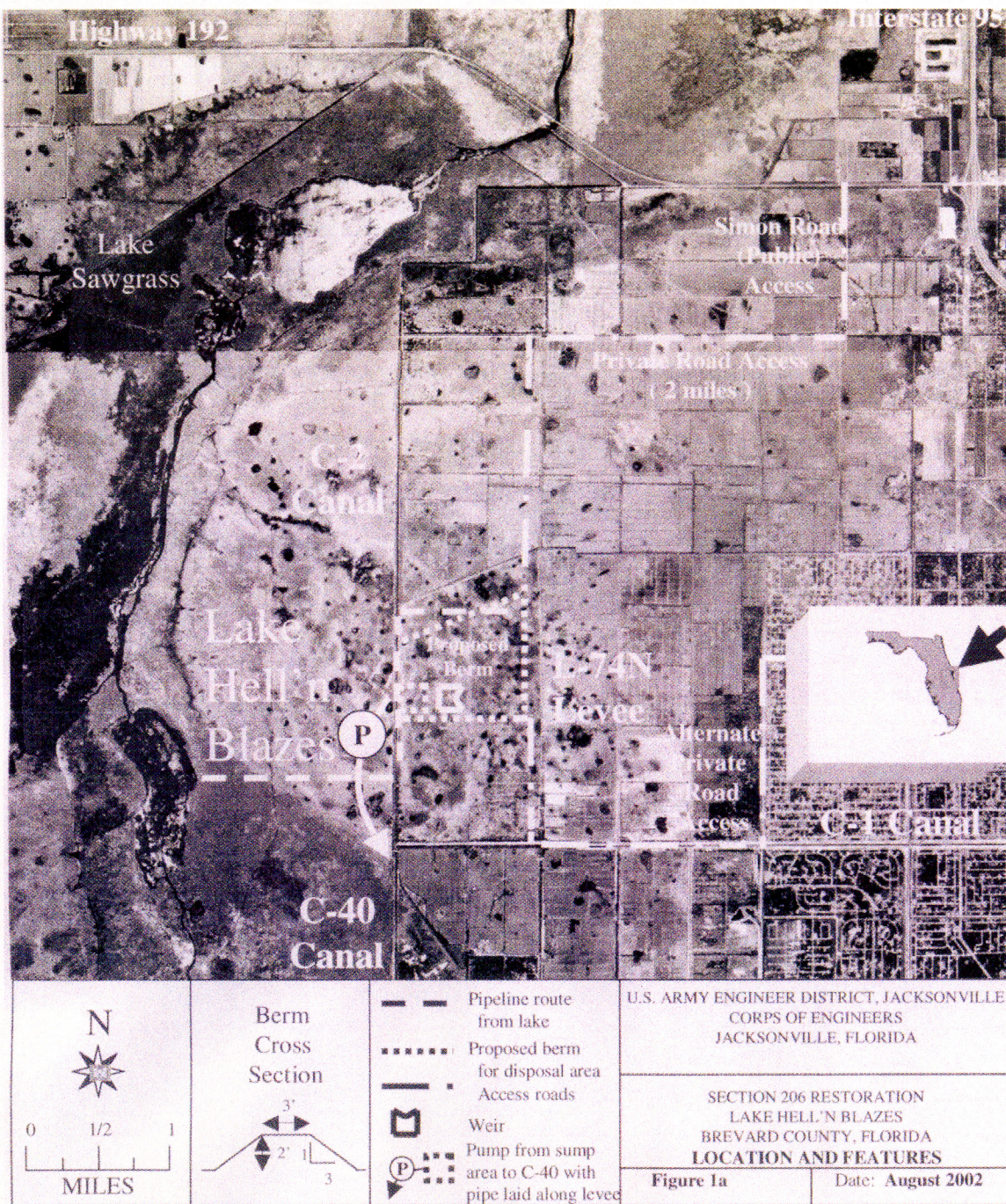
n. Under no circumstances shall the total Federal cost of the environmental restoration, including previous study costs, exceed the legislated maximum per modification total cost of \$5,000,000;

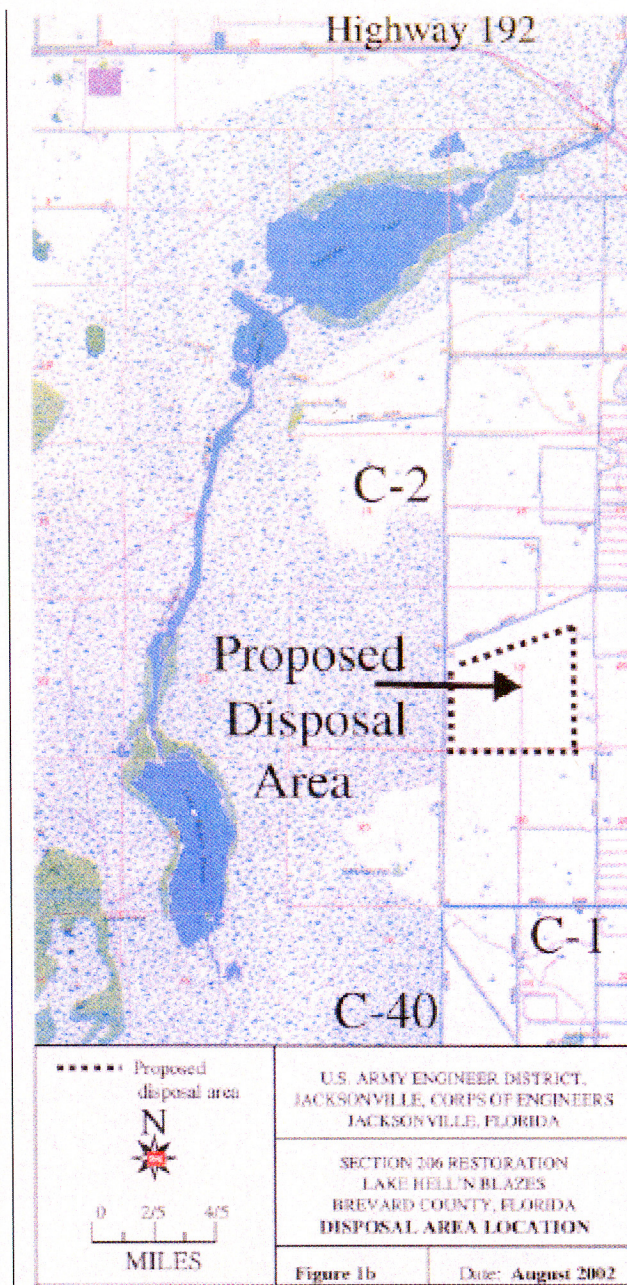
The recommendations contained herein reflect information available at this time and current Departmental policies governing formulation of individual projects. Consequently, the recommendations may be modified before they are approved for implementation.

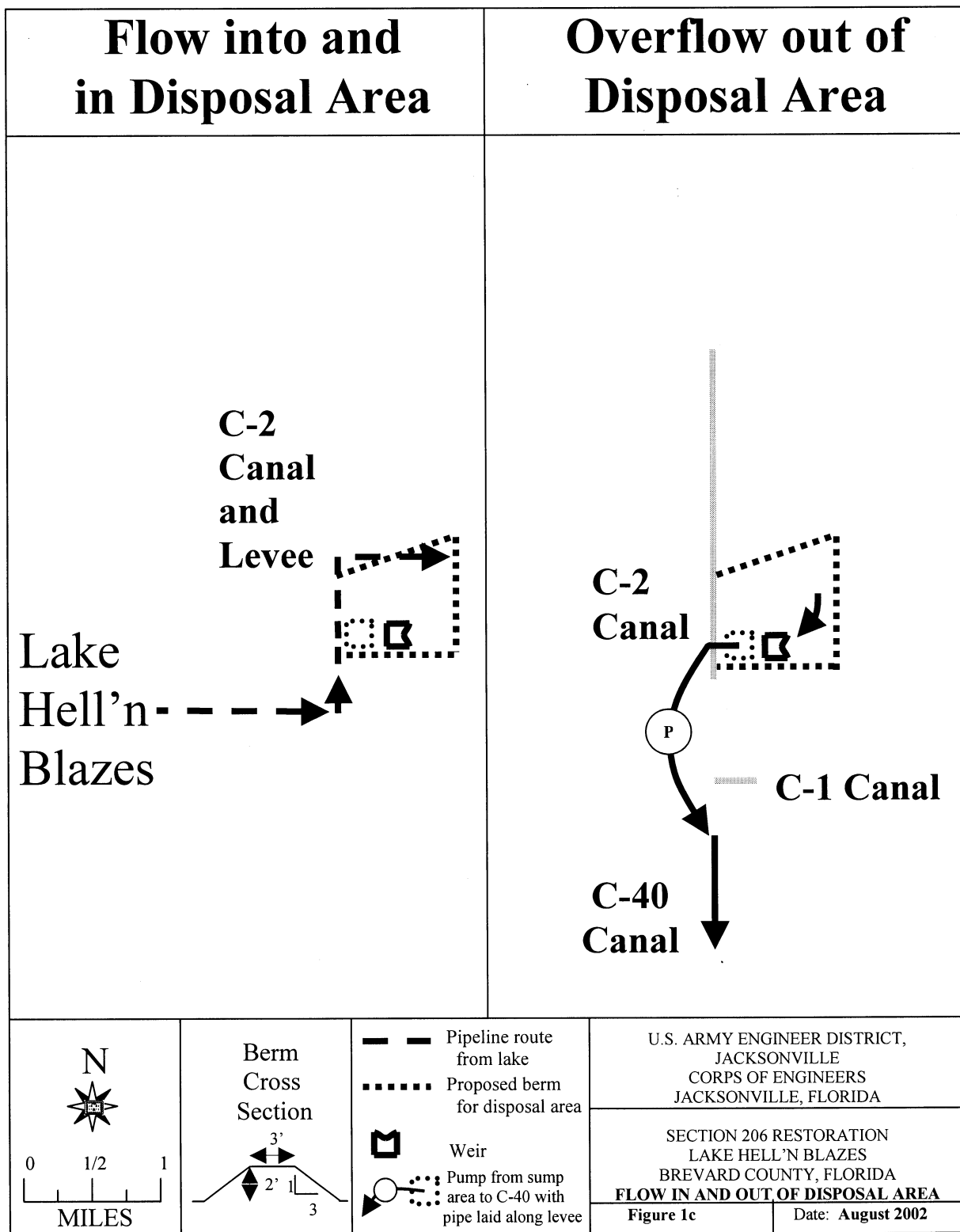

ROBERT M. CARPENTER
Colonel, Corps of Engineers
Commanding

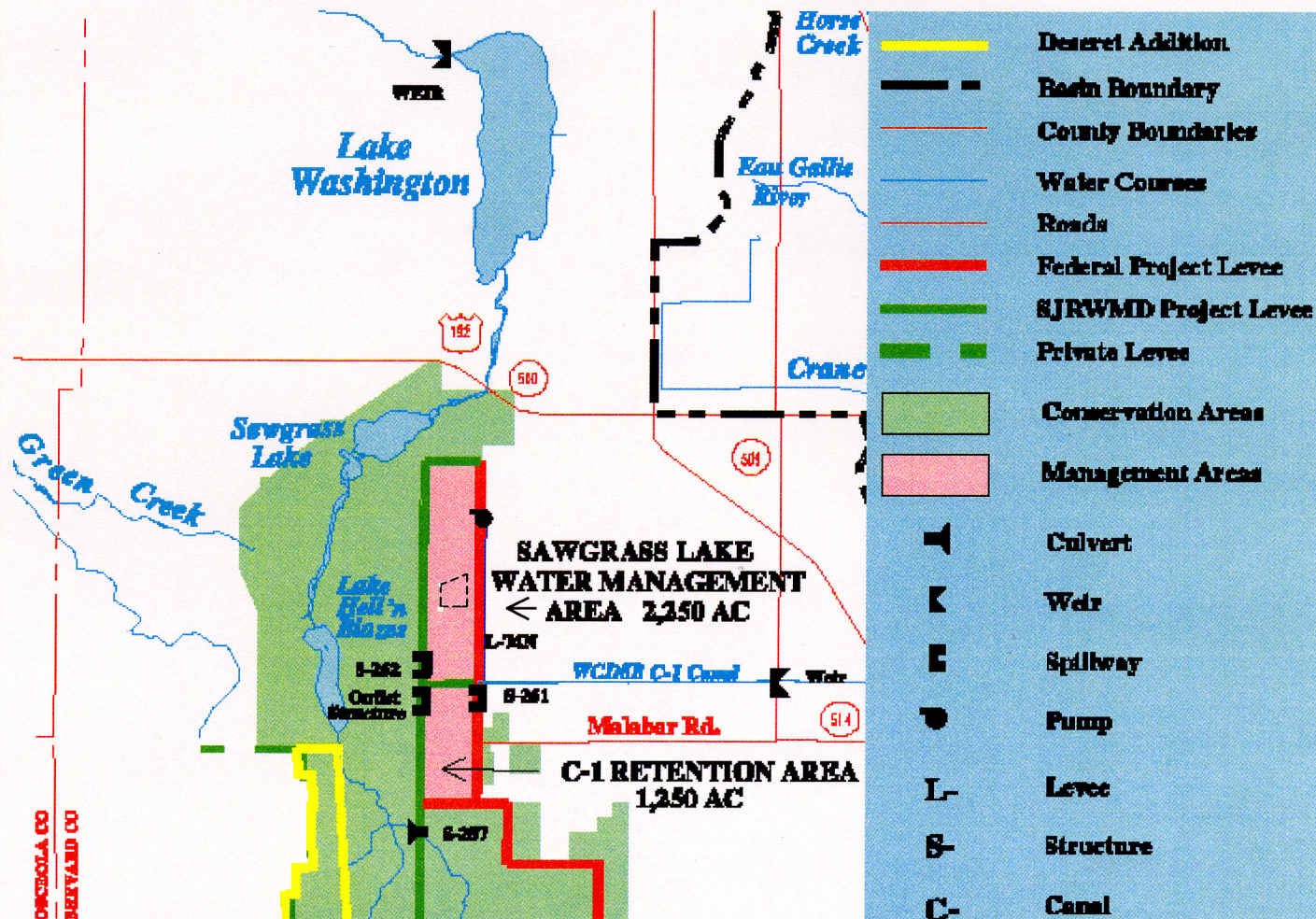
10 REFERENCES

- a. Lake Sawgrass and Lake Hell'n Blazes Section 206 Preliminary Restoration Plan, November 1999
- b. Langeland, K. (1996). *Hydrilla verticillata*, The Perfect Aquatic Weed. *Castanea* 61:293-304.









Upper St. Johns River Basin Project (Northern Portion)

Source: <http://www.sjrwmd.com/programs/index.html> (most legible version)



□ = Disposal Area for Lake Material within future Sawgrass Lake Water Management Area

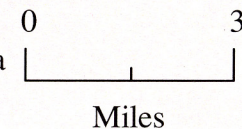
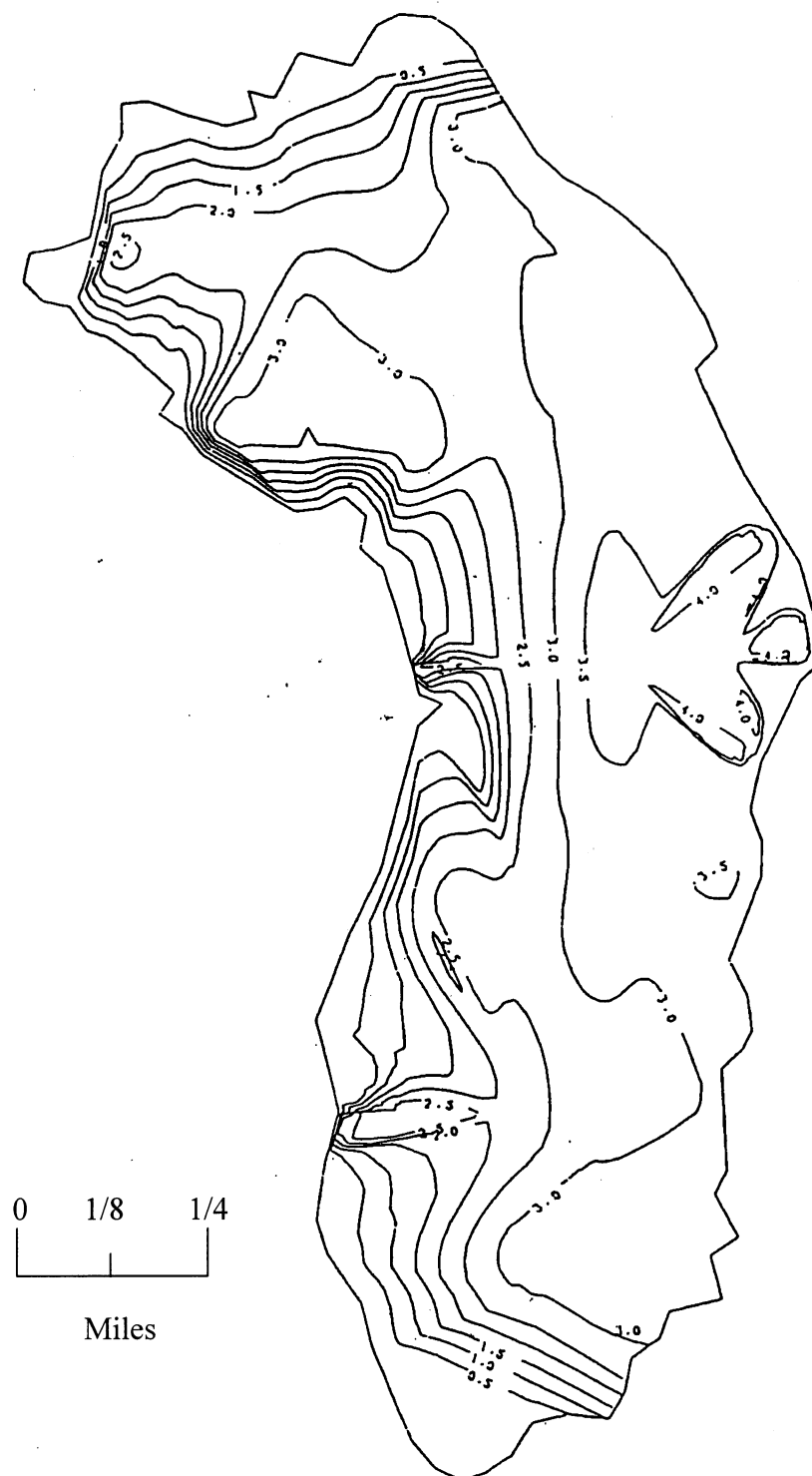


Figure 1d
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Figure 2

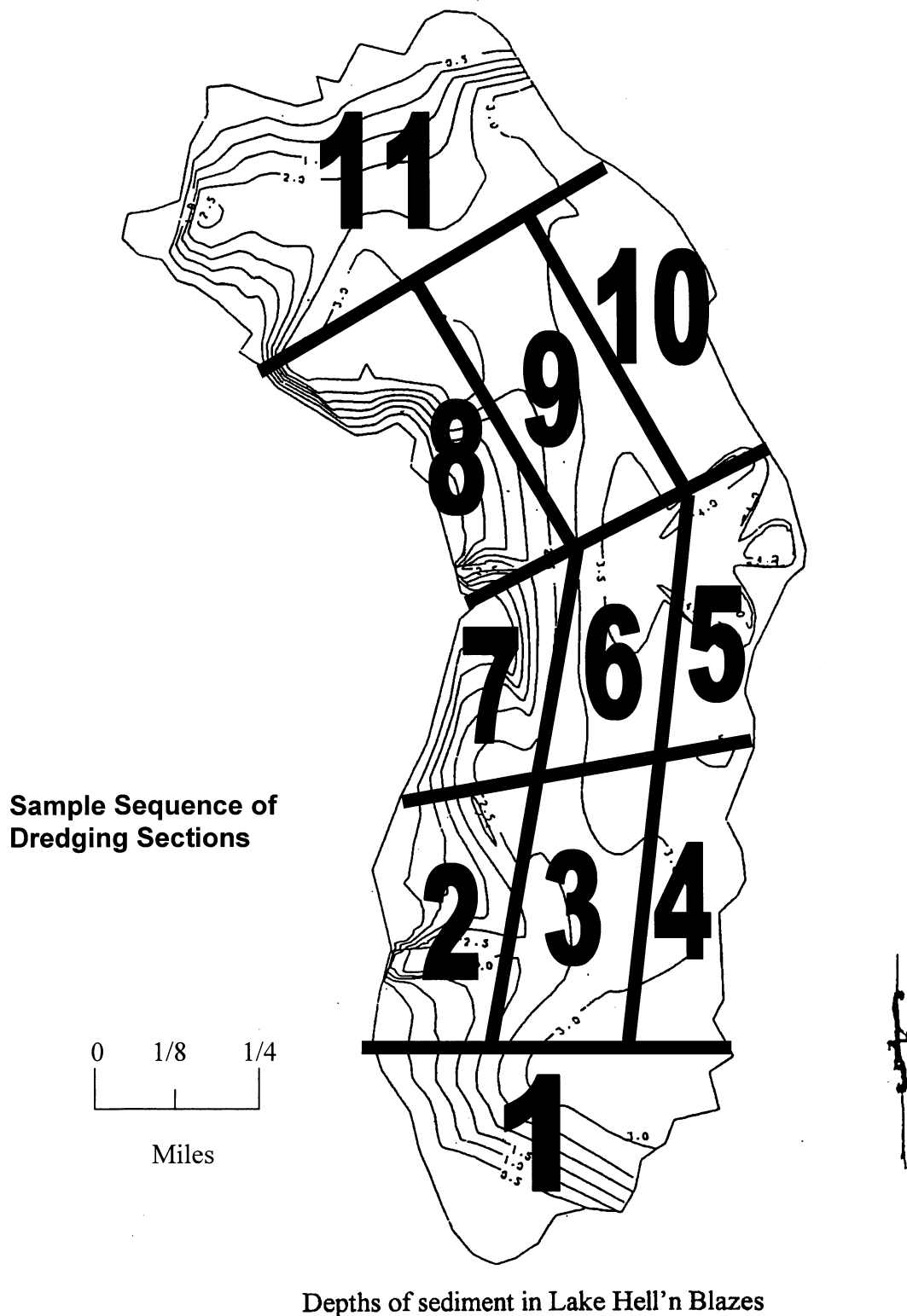


Depths of sediment in Lake Hell'n Blazes

ERR Lake Hell'n Blazes

January 2004

Figure 3



Appendix A
Real Estate

REAL ESTATE PLAN
LAKE HELL’N BLAZES RESTORATION PROJECT
BREVARD COUNTY, FLORIDA
ECOSYSTEM RESTORATION REPORT
SECTION 206

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REAL ESTATE PLAN FOR
LAKE HELL'N BLAZES RESTORATION PROJECT
BREVARD COUNTY, FLORIDA
ECOSYSTEM RESTORATION REPORT
SECTION 206

1. STATEMENT OF PURPOSE.

The Real Estate Plan is tentative in nature for planning purposes only and both the final real property acquisition lines and the real estate cost estimates provided are subject to change even after approval of the Ecosystem Restoration Report (Section 206).

2. PROJECT AUTHORIZATION.

This report is authorized under the Authority of Section 206 of the Water Resources Development Act (WRDA) of 1996 (PL 104-303), as amended. This act allows the Corps of Engineers to investigate, study and construct projects that will improve the quality of the environment. The act reads, in part, as follows: "The Secretary may carry out an aquatic ecosystem restoration and protection project if the Secretary determines that the project 1) will improve the quality of the environment and is in the public interest, and 2) is cost effective".

3. PROJECT LOCATION AND DESCRIPTION.

a. Lake Hell'n Blazes is located in Brevard County, Florida, which is approximately midway down the Atlantic Coast of Florida. The study area is approximately 20 miles southwest of Cocoa Beach or 45 miles southeast of Orlando, or 15 miles west of Melbourne. The lake is located in the central portion of the county, which is comprised of natural marshes and agricultural areas. The lake is upstream (south) of Lake Washington, which is the first large lake in the Upper St. Johns River Basin.

b. The recommended plan for the Lake Hell'n Blazes Project involves restoration of Lake Hell'n Blazes within the Upper St. Johns River Basin that has been adversely impacted by high sedimentation, destruction of fish and wildlife habitat, and degraded water quality conditions. This project consists of removal of approximately 609 acre-feet (.98 million cubic yards) of unconsolidated muck from the bottom of the lake using a hydraulic dredge. The dredged material will be placed in a 383 acre site which is within the Sawgrass Lake Water Management Area(SLWMA). The disposal area is currently drained pasture land which, when filled will no longer be suitable for grazing or construction but will be reflooded by the SLWMA project. The SLWMA is an upland area that will be used to retain urban runoff from the City of Palm Bay to the southeast.

c. Access to the dredging site will be the Highway 192 bridge. The bridge will be temporarily converted to a one-lane bridge while equipment is lowered into the water near Lake Hell'n Blazes. Alternative method of access to the dredging site will be the SJRWMD boat ramp to the southeast of Highway 192 Bridge. There are no land costs associated with this access route.

d. There is an existing private access road north of the project that will be used as an access route to the staging and disposal areas. The road runs in an east to west direction, is approximately 2 miles

long, 50 feet wide and consists of approximately 12.12 acres with an estimated value of \$2,662 for a temporary access road easement for a period of 6 months. The owner is unwilling to grant a 12 month temporary access road easement. If needed, an alternate access is available through the C-1 Canal.

e. The disposal area consists of 383 acres with an estimated fee value of \$842,600. The staging area is a triangular shaped area with a common side to the disposal area and consists of 150 acres with an estimated value of \$33,000 for a temporary work area easement for a period of 1 year.

4. FEDERAL GOVERNMENT OWNED LAND.

There are no Federally owned lands within the project limits.

5. NON-FEDERALLY OWNED LAND.

The Non-Federal sponsor is St. Johns River Water Management District (SJRWMD). The sponsor owns the C-1 canal access road. The disposal site and staging area are owned by SJRWMD and are adjacent to, but not part of, the Federal projects known as the Upper St. Johns River Basin (USJRB) Project or the Central & Southern Florida Flood Control Project.

6. ESTATES.

a. Standard Estates:

1. Fee – The fee simple title to (the land described in Schedule A) (Tracts Nos. ____ & ____), subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

2. Temporary Road Easement - A temporary and assignable easement and right-of-way in, on, over, and across (The land described in Schedule A) for a period not to exceed six months, for the location, construction, operation, maintenance, alteration, replacement and use of (an) access road and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the owners, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land at the locations indicated in Schedule B; subject, however, to existing easements for public roads and highways, public utilities, railroads, and pipelines.

3. Temporary Work Area Easement - A temporary and assignable easement and right-of-way in, on, over and across (The land described in schedule A) (Tracts Nos. ____ and ____), for a period not to exceed 12 months, beginning with date possession of the land is granted to the SJRWMD, (for use by the United States,) its representatives, agents and contractors as a (borrow area)(work area), including the right to (borrow and/or deposit fill, spoil and waste material thereon)(move, store and remove equipment and supplies) and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Lake Hell's Blazes Restoration Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby

acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

b. Non Standard Estates:

There are no non-standard estates identified for this project.

7. NON-FEDERAL AUTHORITY TO PARTICIPATE IN THE PROJECT.

a. The St. Johns River Water Management District is the Non-Federal sponsor of the project and was created by virtue of Florida Statutes, Chapter 373, and section 069. The St. Johns River Water Management District is specifically empowered to “Cooperate with the United States in the manner provided by Congress for flood control, reclamation conservation, and allied purposes in protecting the inhabitants, the land, and other property within the district from the effects of a surplus or a deficiency of water when the same may be beneficial to the public health, welfare, safety, and utility.” (Section 373.103).

b. To carry out the above purposes, the St. Johns River Water Management District is empowered to “acquire fee title to real property and easements therein by purchase for flood control, water storage, water management, and preservation of wetlands, streams and lakes” (Section 373.139).

c. Chapter 373, Section 451, known as the Surface Water Improvement and Management Act (SWIM), provided for surface water improvement and management of various surface water functions by the regional water management districts. It says, in part, “it is the duty of the state, through the state’s agencies and subdivisions, to enhance the environmental and scenic value of surface water...”

8. MINERALS.

There are no known minerals of value in the project area.

9. HAZARDOUS AND TOXIC WASTES (HTW).

In accordance with Engineering Regulation (ER) 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, an initial HTRW assessment appropriate for this project has been completed. There have been no hazardous or toxic wastes identified within the project area.

10. RELOCATION ASSISTANCE PAYMENTS (Public Law 91-646).

No person or business will require relocation.

11. RELOCATIONS, ALTERATIONS, VACATIONS AND ABANDONMENTS (Public Law 85-500).

No governmental structures or facilities that come within the purview of Section 111 of the Rivers and Harbors Act of 1958 (PL 85-500) approved 3 July 1958 will be affected by the project.

12. INDUCED FLOODING.

There will be no induced flooding directly associated with this project.

13. MITIGATION.

There will be no mitigation associated with this project.

14. ACQUISITION/ADMINISTRATIVE COSTS.

- a. The estimate of the Federal real estate acquisition administrative cost is \$15,000. This figure includes project real estate planning, review and monitoring costs.
- b. The Non-Federal sponsor will receive credit towards its share of real estate administrative project costs incurred for certification. Administrative costs are estimated to be \$17,000.

15. SUMMARY OF REAL ESTATE COSTS.

The following cost figures are subject to change prior to construction:

a. Lands and Damages:		\$ 878,262
Fee (383 acs)	\$842,600	
Temporary Easements (162.12 acs)	\$ 35,662	
b. Acquisition - Administrative costs (Includes Corps Real Estate planning and monitoring costs)		
Federal		\$ 15,000
Non-Federal		\$ 17,000
c. Contingencies (25%)		\$ 227,565
TOTAL ESTIMATED REAL ESTATE COSTS		\$1,137,827

16. REAL ESTATE ACQUISITION SCHEDULE.

Acquiring fee/easements is the responsibility of the Non Federal sponsor. Based on the amount of land needed to be acquired, it will take approximately 12 months to acquire lands after the Project Cooperation Agreement (PCA) is signed.

17. MAPS.

Real estate maps of the proposed project area are enclosed with this report.

REAL ESTATE CHART OF ACCOUNTS

01	LANDS AND DAMAGES		
01A00	PROJECT PLANNING		\$ 10,000
01B--	ACQUISITIONS		
01B20	BY LOCAL SPONSOR (LS)		10,000
01B40	REVIEW OF LS		2,000
01E--	APPRAISALS		
01E30	BY LS		6,000
01E50	REVIEW OF LS		3,000
01G--	TEMPORARY PERMITS/LICENSES/RIGHTS-OF-ENTRY		
01G20	BY LS		1,000
01R--	REAL ESTATE PAYMENTS		
01R10	LAND PAYMENTS		
01R1B	BY LS		878,262
TOTAL REAL ESTATE COST EXCLUDING CONTINGENCY			\$ 910,262
TOTAL REAL ESTATE CONTINGENCY COST		\$227,565	
TOTAL PROJECT REAL ESTATE COST			\$1,137,827

Appendix B

Engineering and Cost Estimate

**HELL'N BLAZES
BREVARD COUNTY, FLORIDA
SECTION 206 – ENVIRONMENTAL RESTORATION REPORT (ERR)**

**APPENDIX B
ENGINEERING**

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**LAKE HELL'N BLAZES
BREVARD COUNTY, FLORIDA
SECTION 206 – ENVIRONMENTAL RESTORATION REPORT (ERR)**

**APPENDIX B
ENGINEERING**

A. INTRODUCTION

1. General. The project is located in Brevard County on the East Coast of Florida approximately 15 miles west of the city of Melbourne and south of Highway 192. The project plan and location map are shown on Plate B-1.

2. Restoration Plan. The restoration plan would involve the removal of muck from Lake Hell'n Blazes and placing it in the selected disposal area located within the Sawgrass Lake Water Management Area as shown on Plate B-1. A discussion of the features of the restoration plan is provided in the main report. This includes a description of the lake sediments and the method used by the sponsor to estimate the quantity.

B. HYDROLOGY AND HYDRAULICS

3. Hydraulic Considerations. The proposed removal of sediments from the lake would not impact the with-project condition in the basin. The effluent from the disposal area would be pumped into Canal 40 (C-40) south of Canal 1 (C-1).

C. GEOTECHNICAL INVESTIGATIONS

4. Materials Encountered. Subsurface investigations were performed for the design of Levee 74 North Remainder. Out of this program, 12 core borings and 12 test pits are applicable to the subject study. Core borings CB-L74N-103 through CB-L74N-109, borings CB-74NR-1 through CB-74NR-5 and test pits TP-L74NR-3 through TP-74NR-14 were performed along the eastern boundary of the proposed disposal area. The depth of the borings ranged from 10.5 feet to 15 feet and the test pits were all excavated to a depth of 10 feet. In general, the borings/test-pits encountered a layer of poorly-graded sand overlying a layer of clayey sand followed by interbedded layers of high-plasticity clay, clayey sand, low-plasticity clay and silty

sand. The density of the sand layers ranged from very loose to medium. The consistency of the fine-grained soils ranged from very soft to very stiff.

5. Embankment Material. Fill material for the proposed north and south separator berms will most likely come from side excavation within the disposal area. Materials classified by the Unified Soil Classification System as GW, GP, GM, GC, SW, SP, SC, SM, and CL may be used for these berms. Based on the materials encountered by the borings and test pits discussed above, suitable material will be available in sufficient quantity to construct both berms.

6. Stability Analysis. Slope stability analyses were performed for the design of Levee 74 North Remainder using the slope stability program UTEXAS-3. Based on the analysis of a typical levee section forming the eastern limit of the borrow area, the side slopes for the containment berms should be 1 vertical to 3 horizontal.

7. Additional Investigations. Prior to completion of Plans and Specifications, material samples would be obtained at various locations within each lake for the purpose of classification and laboratory analysis. Analysis would provide the percentages of sand and organic content as well as other characteristics. This information would be useful in evaluating the effectiveness of the disposal operation in maintaining the water quality of the effluent for this project and future projects with similar materials.

D. CONSTRUCTION

8. General. This is an environmental restoration project to remove sediments and enhance water quality, and there are not any specific hydraulic or navigation design requirements to be satisfied. Elements of design, design assumptions, and anticipated methods for construction are presented in the paragraphs that follow.

9. Excavation. The muck in Lake Hell'n Blazes would be removed by a small hydraulic dredge and pumped into the selected disposal area located within the Sawgrass Lake Water Management Area. As stated in the main report, dredging would be performed in sections with emphasis on upstream areas. Approximately three months prior to the commencement of dredging, the lake would be treated for the hydrilla.

10. Disposal Area. The disposal area containment berms would be constructed with material obtained from within the disposal area. A discussion of the berm construction is provided in the Geotechnical Section above. A temporary weir and effluent impoundment area would be constructed at the optimum low point within the disposal area adjacent to Canal 2. A pump would be placed near the impoundment area to transfer the disposal area effluent by pipeline into Canal 40 to be returned to the basin.

Additional berms in the form of cross-dikes may be required within the disposal area to provide for an even distribution of material throughout the area and to prevent short-circuiting of the dredge effluent.

11. Construction Procedure. The first order of work would be to construct the disposal area berms, weir and impoundment area, and installation of the temporary pump. Excavation of the muck would follow with degrading of the berms and removal of the weir and pump as the last order of work.

D. RELOCATIONS

12. General. The project sponsor would be responsible for providing all the lands easements, rights-of-way, relocations, and disposal (LERRD) as required for construction of the proposed project features.

13. Access Roads. Access to the disposal area would be provided as shown on Plate B-1. The costs for stabilizing approximately 2 miles of private road and another 2 miles across the sponsors land are included in the Project Cost Estimate.

F. OPERATION AND MAINTENANCE

14. General. The contractor would be responsible for all maintenance during the construction contract. After completion of the construction contract, the project sponsor would assume the responsibility for maintaining the project. A discussion of Operation and Maintenance is presented in the main report.

G. QUANTITIES AND COST ESTIMATE

15. Summary of Costs. The estimates of first cost for construction of the alternative plans listed below were prepared using M-CACES software and are presented in Table B-1. The estimate includes a narrative, a summary cost, and a detailed cost showing quantity, unit cost, and the amount for contingencies for each cost item.

Plan 1. Removal of material from the upstream (south) half of Lake Hell'n Blazes

Plan 2. Removal of material from all of Lake Hell'n Blazes

The costs have been prepared for an effective date of May 2003.

Wed 21 May 2003
Eff. Date 05/21/03

U.S. Army Corps of Engineers
PROJECT LS&HB3: Lake Hell'n Blazes-Half Lake - Ecosystem Restoration
PLANNING COST ESTIMATE

TIME 11:24:31

TITLE PAGE 1

Lake Hell'n Blazes-Half Lake
Ecosystem Restoration
Brevard County, Florida

Designed By: Jacksonville District
Estimated By: Jacksonville District - M.P.

Prepared By: Jacksonville District - M.P.

Preparation Date: 05/21/03
Effective Date of Pricing: 05/21/03
Est Construction Time: 135 Days

Sales Tax: 6.00%

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PROJECT NOTES

U.S. Army Corps of Engineers
PROJECT LS&HB3: Lake Hell'n Blazes-Half Lake - Ecosystem Restoration
PLANNING COST ESTIMATE

TIME 11:24:31
TITLE PAGE 2

DESCRIPTION OF PROJECT

Preliminary cost estimates are hereby prepared for planning purposes for a Section 206 Environmental Restoration Report for Hell'n Blazes Project. The study area is located in Brevard County, Florida, approximately 45 miles southeast of Orlando, Florida.

Cost estimates included are the removal of 490,000 cubic yards of material from Lake Hell'n Blazes to improve habitat on 129 of the 258 acres of the lake.

Dredged material will be placed on an upland disposal site. The material will be spreaded in a thin layer over disposal site that is slated to become a water management area.

Cost estimate includes 15% of construction costs for contingencies, unknowns and/or unanticipated conditions.

Real Estate costs is not included in this estimate.

E&D costs were provided by Engineering Division.

Construction Management costs were included at 8.5% of construction cost.

Wed 21 May 2003
Eff. Date 05/21/03

U.S. Army Corps of Engineers
PROJECT LS&HB3: Lake Hell'n Blazes-Half Lake - Ecosystem Restoration

TIME 11:24:31

PLANNING COST ESTIMATE

SUMMARY PAGE 1

** PROJECT OWNER SUMMARY - Feature (Rounded to 100's) **

		QUANTITY UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST
1 Cleaning 1/2 Lake Hell'n Blazes						
1-	09	CHANNEL AND CANALS	2,346,200	351,900	0	2,698,100
1-	30	PLANNING, ENGINEERING & DESIGN	189,600	28,400	0	218,000
1-	31	CONSTRUCTION MANAGEMENT	199,400	29,900	0	229,300
TOTAL Cleaning 1/2 Lake Hell'n Blazes			2,735,200	410,300	0	3,145,500

Wed 21 May 2003

U.S. Army Corps of Engineers

TIME 11:24:31

Eff. Date 05/21/03

PROJECT LS&HB3: Lake Hell'n Blazes-Half Lake - Ecosystem Restoration

PLANNING COST ESTIMATE

SUMMARY PAGE 2

** PROJECT OWNER SUMMARY - Element (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST

1 Cleaning 1/2 Lake Hell'n Blazes					
1- 09 CHANNEL AND CANALS					
1- 09/01 Channels					
1- 09/01.01	Mob, Demob & Preparatory Work	227,400	34,100	0	261,500
1- 09/01.16	Pipeline Dredging 490000.00 CY	1,504,300	225,600	0	1,729,900
1- 09/01.20	Disposal Area	245,200	36,800	0	282,000
1- 09/01.99	Associated General Items	369,300	55,400	0	424,700
TOTAL Channels		2,346,200	351,900	0	2,698,100
TOTAL CHANNEL AND CANALS		2,346,200	351,900	0	2,698,100

1- 30	PLANNING, ENGINEERING & DESIGN	189,600	28,400	0	218,000
1- 31	CONSTRUCTION MANAGEMENT	199,400	29,900	0	229,300
TOTAL Cleaning 1/2 Lake Hell'n Blazes		2,735,200	410,300	0	3,145,500

Wed 21 May 2003
Eff. Date 05/21/03

U.S. Army Corps of Engineers
PROJECT LS&HB3: Lake Hell'n Blazes-Half Lake - Ecosystem Restoration
PLANNING COST ESTIMATE

TIME 11:24:31

SUMMARY PAGE 3

** PROJECT OWNER SUMMARY - CostItem (Rounded to 100's) **

		QUANTITY UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST

1 Cleaning 1/2 Lake Hell'n Blazes						
1- 09 CHANNEL AND CANALS						
1- 09/01 Channels						
1- 09/01.01 Mob, Demob & Preparatory Work						
1-	09/01.01. 1	Mob, Demob & Prep.Work -Dredging	178,600	26,800	0	205,400
1-	09/01.01. 2	Mob, Demob & Prep.Work- Land Eq.	31,800	4,800	0	36,500
1-	09/01.01. 3	Prep Work	17,000	2,500	0	19,500
TOTAL Mob, Demob & Preparatory Work			227,400	34,100	0	261,500

1-	09/01.16	Pipeline Dredging	490000.00 CY	1,504,300	225,600	0 1,729,900
1- 09/01.20 Disposal Area						
1-	09/01.20. 1	Clearing for Dikes	10.00 ACR	24,200	3,600	0 27,900
1-	09/01.20. 2	Const D/A Berms	18000.00 CCY	49,500	7,400	0 56,900
1-	09/01.20. 3	Install/Remove Weir		4,800	700	0 5,600
1-	09/01.20. 4	Degrade D/A Berms	18000.00 CCY	17,500	2,600	0 20,200
1-	09/01.20. 5	Flocculant at D/A	490000.00 CY	79,200	11,900	0 91,100
1-	09/01.20. 6	Inst./Rem Temporary Sump Pump		57,200	8,600	0 65,800
1-	09/01.20. 7	Construct/Remove Sump		12,700	1,900	0 14,600
TOTAL Disposal Area			245,200	36,800	0	282,000

1- 09/01.99 Associated General Items						
1-	09/01.99. 1	Turbidity Monitoring	4.00 MO	25,400	3,800	0 29,200
1-	09/01.99. 2	Inst./Rem Turbidity Barriers	2000.00 LF	27,000	4,100	0 31,100
1-	09/01.99. 3	Install/Remove Pipeline to C40	7900.00 LF	111,400	16,700	0 128,100
1-	09/01.99. 4	Access Road Improvements	36000.00 SY	205,400	30,800	0 236,200
TOTAL Associated General Items			369,300	55,400	0	424,700
TOTAL Channels			2,346,200	351,900	0	2,698,100
TOTAL CHANNEL AND CANALS			2,346,200	351,900	0	2,698,100

1-	30	PLANNING, ENGINEERING & DESIGN		189,600	28,400	0 218,000
1-	31	CONSTRUCTION MANAGEMENT		199,400	29,900	0 229,300
TOTAL Cleaning 1/2 Lake Hell'n Blazes			2,735,200	410,300	0	3,145,500

Wed 14 May 2003
Eff. Date 05/06/03

U.S. Army Corps of Engineers
PROJECT LS&HB2: Lake Hell'n Blazes - Full Lake - Ecosystem Restoration
PLANNING COST ESTIMATE

TIME 10:27:49
TITLE PAGE 1

Lake Hell'n Blazes - Full Lake
Ecosystem Restoration
Brevard County, Florida

Designed By: Jacksonville District
Estimated By: Jacksonville District - M.P.

Prepared By: Jacksonville District - M.P.

Preparation Date: 05/06/03
Effective Date of Pricing: 05/06/03
Est Construction Time: 225 Days

Sales Tax: 6.00%

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Wed 14 May 2003

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PROJECT NOTES

U.S. Army Corps of Engineers

PROJECT LS&HB2: Lake Hell'n Blazes - Full Lake - Ecosystem Restoration

PLANNING COST ESTIMATE

TIME 10:27:49

TITLE PAGE 2

DESCRIPTION OF PROJECT

Preliminary cost estimates are hereby prepared for planning purposes for a Section 206 Environmental Restoration Report for Hell'n Blazes Project. The study area is located in Brevard County, Florida, approximately 45 miles southeast of Orlando, Florida.

Cost estimates included are the removal of 980,000 cubic yards of material from Lake Hell'n Blazes to improve habitat on 258 acres of the lake.

Dredged material will be placed on an upland disposal site. The material will be spreaded in a thin layer over disposal site that is slated to become a water management area.

Cost estimate includes 15% of construction costs for contingencies, unknowns and/or unanticipated conditions.

Real Estate costs is not included in this estimate.

E&D costs were provided by Engineering Division.

Construction Management costs were included at 8.5% of construction cost.

Wed 14 May 2003

U.S. Army Corps of Engineers

TIME 10:27:49

Eff. Date 05/06/03

PROJECT LS&HB2: Lake Hell'n Blazes - Full Lake - Ecosystem Restoration

PLANNING COST ESTIMATE

SUMMARY PAGE 1

** PROJECT OWNER SUMMARY - Feature (Rounded to 100's) **

		QUANTITY UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST
1 Cleaning all Lake Hell'n Blazes						
1-	09 CHANNEL AND CANALS		3,948,200	592,200	0	4,540,500
1-	30 PLANNING, ENGINEERING & DESIGN		189,600	28,400	0	218,000
1-	31 CONSTRUCTION MANAGEMENT		335,600	50,300	0	385,900
TOTAL Cleaning all Lake Hell'n Blazes			4,473,400	671,000	0	5,144,400

Wed 14 May 2003
Eff. Date 05/06/03

U.S. Army Corps of Engineers
PROJECT LS&HB2: Lake Hell'n Blazes - Full Lake - Ecosystem Restoration

TIME 10:27:49

PLANNING COST ESTIMATE

SUMMARY PAGE 2

** PROJECT OWNER SUMMARY - Element (Rounded to 100's) **

	QUANTITY	UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST
1 Cleaning all Lake Hell'n Blazes						
1- 09 CHANNEL AND CANALS						
1- 09/01 Channels						
1- 09/01.01	Mob, Demob & Preparatory Work		227,400	34,100	0	261,500
1- 09/01.16	Pipeline Dredging	980000.00 CY	2,989,000	448,400	0	3,437,400
1- 09/01.20	Disposal Area		343,500	51,500	0	395,000
1- 09/01.99	Associated General Items		388,300	58,300	0	446,600
TOTAL Channels			3,948,200	592,200	0	4,540,500
TOTAL CHANNEL AND CANALS			3,948,200	592,200	0	4,540,500
1- 30 PLANNING, ENGINEERING & DESIGN						
1- 30	PLANNING, ENGINEERING & DESIGN		189,600	28,400	0	218,000
1- 31 CONSTRUCTION MANAGEMENT						
1- 31	CONSTRUCTION MANAGEMENT		335,600	50,300	0	385,900
TOTAL Cleaning all Lake Hell'n Blazes			4,473,400	671,000	0	5,144,400

Wed 14 May 2003
Eff. Date 05/06/03

U.S. Army Corps of Engineers
PROJECT LS&HB2: Lake Hell'n Blazes - Full Lake - Ecosystem Restoration

TIME 10:27:49

PLANNING COST ESTIMATE

SUMMARY PAGE 3

** PROJECT OWNER SUMMARY - CostItem (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST

1 Cleaning all Lake Hell'n Blazes					
1- 09 CHANNEL AND CANALS					
1- 09/01 Channels					
1- 09/01.01 Mob, Demob & Preparatory Work					
1- 09/01.01. 1 Mob, Demob & Prep.Work -Dredging		178,600	26,800	0	205,400
1- 09/01.01. 2 Mob, Demob & Prep.Work- Land Eq.		31,800	4,800	0	36,500
1- 09/01.01. 3 Prep Work		17,000	2,500	0	19,500

TOTAL Mob, Demob & Preparatory Work		227,400	34,100	0	261,500
1- 09/01.16 Pipeline Dredging	980000.00 CY	2,989,000	448,400	0	3,437,400
1- 09/01.20 Disposal Area					
1- 09/01.20. 1 Clearing for Dikes	10.00 ACR	24,200	3,600	0	27,900
1- 09/01.20. 2 Const D/A Berms	18000.00 CCY	49,500	7,400	0	56,900
1- 09/01.20. 3 Install/Remove Weir		4,800	700	0	5,600
1- 09/01.20. 4 Degrade D/A Berms	18000.00 CCY	17,500	2,600	0	20,200
1- 09/01.20. 5 Flocculant at D/A	980000.00 CY	158,400	23,800	0	182,200
1- 09/01.20. 6 Inst./Rem Temporary Sump Pump		76,300	11,400	0	87,700
1- 09/01.20. 7 Construct/Remove Sump		12,700	1,900	0	14,600

TOTAL Disposal Area		343,500	51,500	0	395,000
1- 09/01.99 Associated General Items					
1- 09/01.99. 1 Turbidity Monitoring	7.00 MO	44,500	6,700	0	51,200
1- 09/01.99. 2 Inst./Rem Turbidity Barriers	2000.00 LF	27,000	4,100	0	31,100
1- 09/01.99. 3 Install/Remove Pipeline to C40	7900.00 LF	111,400	16,700	0	128,100
1- 09/01.99. 4 Access Road Improvements	36000.00 SY	205,400	30,800	0	236,200

TOTAL Associated General Items		388,300	58,300	0	446,600

TOTAL Channels		3,948,200	592,200	0	4,540,500

TOTAL CHANNEL AND CANALS		3,948,200	592,200	0	4,540,500
1- 30 PLANNING, ENGINEERING & DESIGN		189,600	28,400	0	218,000
1- 31 CONSTRUCTION MANAGEMENT		335,600	50,300	0	385,900

TOTAL Cleaning all Lake Hell'n Blazes		4,473,400	671,000	0	5,144,400

**Environmental
Assessment
Attachment**

**ENVIRONMENTAL ASSESSMENT
LAKE HELL 'N BLAZES
BREVARD COUNTY, FLORIDA**

PRELIMINARY FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the information analyzed in the Environmental Assessment (EA) for the proposed action, reflecting pertinent information obtained from other agencies having jurisdiction by law and/or special expertise. I conclude that the proposed action would not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary:

a. The proposed action includes restoration of the entire area of Lake Hell 'n Blazes by hydraulic dredging, with placement of dredged material into a 383 acre disposal site.

b. A Fish and Wildlife Coordination Act Report has been prepared. This report indicates no objection by the Department of the Interior, as well as full compliance with the Endangered Species and Fish and Wildlife Coordination Acts. The proposed action would not jeopardize the continued existence of any threatened or endangered species or adversely impact any designated critical habitat.

c. The proposed project has been determined to be consistent with the Florida Coastal Zone Management Program and has received concurrence of the State of Florida.

d. Historic properties eligible for listing on the National Register of Historic Places have been recorded in the project Area of Potential Effect. Further cultural resources investigations are ongoing and will be completed prior to construction in order to fulfill the requirements of the National Historic Preservation Act.

ROBERT M. CARPENTER
Colonel, Corps of Engineers
Commanding

Date

NOVEMBER 2003

Draft Environmental Assessment

ECOSYSTEM RESTORATION REPORT WITH ENVIRONMENTAL ASSESSMENT LAKE HELL 'N BLAZES

Brevard County, FL



U.S. Army Corps
of Engineers
JACKSONVILLE
DISTRICT

ENVIRONMENTAL ASSESSMENT
ECOSYSTEM RESTORATION REPORT WITH ENVIRONMENTAL
ASSESSMENT
LAKE HELL 'N BLAZES
Brevard County, Florida

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ENVIRONMENTAL ASSESSMENT

LAKE HELL 'N BLAZES Brevard County, Florida

1 PROJECT PURPOSE AND NEED

1.1 PROJECT AUTHORITY.

This project is authorized under Section 206 of the Water Resources Development Act (WRDA) of 1996 (PL 104-303) as amended. The act reads, in part, as follows: "The Secretary may carry out an aquatic ecosystem restoration and protection project if the Secretary determines that the project – (1) will improve the quality of the environment and is in the public interest; and (2) is cost-effective."

1.2 PROJECT LOCATION.

Lake Hell 'n Blazes is located in Brevard County, Florida, which is approximately midway down the Atlantic Coast of Florida. The study area (shown in Figure 1) is approximately 20 miles southwest of Cocoa Beach, 45 miles southeast of Orlando, FL, or 15 miles west of Melbourne. The lake is located in the central portion of Brevard County, which is comprised primarily of natural marshes and agricultural/undeveloped areas. Lake Hell 'n Blazes is located upstream (south) of Lake Sawgrass and Lake Washington. The disposal site is located in the Sawgrass Lakes Water Management Area (SLWMA) which is located immediately southeast of Lake Sawgrass. The SLWMA is a 2,240-acre tract contiguous with the Three Forks Marsh Conservation Area to the south and terminates near US192 to the north. See Figure 2.

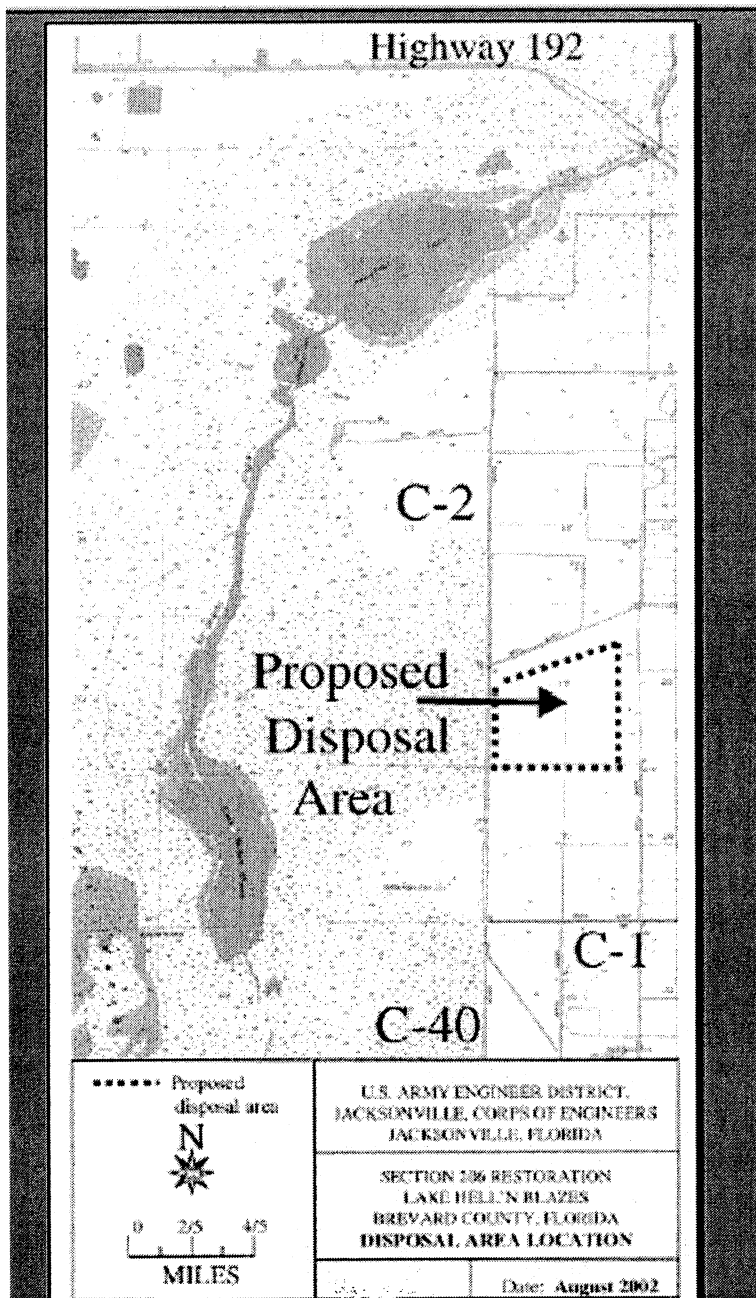


Figure 2 Proposed Disposal Site

1.3 PROJECT NEED OR OPPORTUNITY.

Lake Hell 'n Blazes (258 acres) has been adversely impacted by the accumulation of soft uncompacted organic sediments. The accumulations of these sediments have been related to changes in historical drainage patterns and the proliferation of exotic plants (Cox et al. 1976). Historically, bottom sediments in Lake Hell 'n Blazes were comprised of a compacted fibrous organic peat underlain by sand and clay deposits (Lowe et al. 1984). In the past 40 years however, these fibrous peat deposits have been buried under an increasing layer of poorly consolidated sedimentary peat, which is highly flocculent and easily resuspended. This unconsolidated layer of muck consists of organic ooze that contains large fragments and incompletely decomposed plant detritus.

An old report on the Upper St. Johns Basin produced by the Central and Southern Flood Control District indicated that the portion of the basin south of Lake Washington originally contained 680 square miles of floodplain during a severe flood. By 1957, only 250 square miles of this floodplain remained. Concurrent with extensive drainage activities and flow alterations, sediment accumulation rates in Lake Hell 'n Blazes increased significantly (Cox 1976; Lowe et al. 1984; Brenner 1997). Organic sedimentation rates were further exacerbated by the proliferation of exotic vegetation. Prior to the 1970's, water hyacinth (*Eichhornia crassipes*) infestations were a significant problem in the Upper Basin lakes. Because there was no ongoing maintenance control program in place at the time, water hyacinths would occasionally nearly completely cover Lake Hell 'n Blazes (D. Cox pers. comm.). These dense hyacinth infestations likely were a primary reason for the loss of the native submersed plant communities and for increased organic sedimentation. Because of its high productivity and rapid growth, dense water hyacinths have been reported to deposit up to 12 inches of organic detritus to the bottom sediments within a single year depending on the productivity of the system. Extensive aerial treatments and subsequent die-off of these infestations also contributed additional organic material and further stressed native plant communities. By the 1980's a maintenance control program for water hyacinths was in place, but hydrilla (*Hydrilla verticillata*) was becoming a problem. In 1994, a survey completed by the Florida Department of Environmental Protection (DEP) stated that hydrilla infestation in Lake Hell 'n Blazes was measured at approximately 92% of the lakes surface area. Hydrilla has been shown to contribute up to 1.2 tons per acre per year of dry organic matter to sediments.

Accumulation of organic sediments has degraded the value of Lake Hell 'n Blazes. Historically this lake was renowned for excellent largemouth bass (*Micropterus salmoides*) fishing. Conditions within the lake have deteriorated to the point that bass fishing is currently considered to be very poor and reproduction of all sportfish within the lakes is severely limited (D. Cox pers.

comm.). Largemouth bass and other Centrarchids typically nest in shallow water on firm substrates. In many Florida lakes bass have been documented to nest on firm fibrous peat substrates but they will avoid unconsolidated muck (Bruno et al. 1990). In such areas they are restricted to nesting on the rhizomes of plants such as spatterdock (*Nuphar luteum*). Lakes in the Upper Basin also typically undergo dissolved oxygen sags during the later summer months (Cox et al. 1976; Lowe et al. 1984). Because the unconsolidated muck has a high chemical and biological oxygen demand and is easily resuspended by wind or currents, it is likely that the volume of this material currently present in Lake Hell 'n Blazes contributes to the frequency, intensity and duration of these events. In addition, aeration of the lakes due to wind mixing is limited by dense hydrilla. This may help explain the increasing frequency of fish kills that have occurred in this lake during the past twenty years (D. Cox pers. comm.).

Continued sedimentation in Lake Hell 'n Blazes will further diminish the remaining habitat for fisheries, and likely result in continuing fish kills. In addition, because these flocculent sediments may be resuspended and transported downstream during major storm events (Cox et al. 1976), they may eventually adversely affect water quality and habitat conditions downstream in Lake Washington. Lake Washington currently supports a valuable sport-fishery and is the main drinking water supply for the City of Melbourne. If Lake Hell 'n Blazes were dredged, it would again provide valuable habitat for fish and wildlife resources and cease to have detrimental impacts on Lake Washington. This would result in improved water quality and greatly improve fisheries habitat.

1.4 RELATED ENVIRONMENTAL DOCUMENTS.

The river basin is also the site of the Upper St. Johns River Basin (USJRB) Project, which is a 2,000 square mile flood control project. The project is designed to provide flood damage reduction and recreational benefits to the area. Current ongoing documents include a Supplement 1 to the Final Environmental Impact Statement (EIS) on Proposed Modifications to Project Features North of the Fellsmere Grade, restoration of Lake Sawgrass, and the C-1 Re-diversion Project. In addition, a future National Environmental Policy Act (NEPA) document is planned that will evaluate and help determine the final water management plan for the SLWMA.

1.5 DECISIONS TO BE MADE.

The District Engineer of the U.S. Army Corps of Engineers, Jacksonville District, must decide whether to perform ecosystem restoration within Lake Hell 'n Blazes or choose the no action alternative. These activities are described in Section 2.1. If he decides to perform ecosystem restoration, he must decide whether to fully or partially restore the lake.

The District Engineer must also determine if the selected alternative would or would not be a major Federal action, significantly affecting the quality of the human environment. If he makes a preliminary determination that it **would not** significantly affect the quality of the human environment, then he can prepare an Environmental Assessment (EA) and unsigned FONSI (Finding of No Significant Impact) and release it for a 30-day public review period before deciding if an EIS is required. However, if the District Engineer immediately determines that the selected alternative **would** significantly affect the quality of the human environment, then an EIS and Record of Decision (ROD) must be prepared and signed before the Lake Hell 'n Blazes Restoration Project could proceed. If the public agrees with the conclusions of the EA and unsigned FONSI during the 30-day review period then the FONSI can be signed and the project can move forward into the next phase, which is plans and specifications.

1.6 RELEVANT ISSUES

The following issues were identified to be relevant to the proposed action and will be further evaluated:

- a. Impacts to area vegetation,
- b. Presence of rare, threatened, or endangered species, and
- c. Water quality.

Other issues that are covered include: fish and wildlife resources, historic properties, recreation, aesthetics, navigation, and socio-economics.

1.7 AGENCY GOAL OR OBJECTIVE

Goals of this project include restoring quality fisheries habitat in Lake Hell 'n Blazes, creating habitat for native, rooted emergent, submersed, and floating aquatic vegetation, minimizing exotic invasive species, as well as providing protection of the capacity and quality of the potable water supply and protecting fish and wildlife habitat in Lake Washington by improving existing water quality in Lake Hell 'n Blazes.

1.8 PERMITS, LICENSES, AND ENTITLEMENTS

A Water Quality Certification (WQC) and Environmental Resource permit would be required from the State of Florida prior to construction activities.

2 ALTERNATIVES

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 ALTERNATIVE #1 NO ACTION

This alternative assumes there would be no project implemented with Federal funds. Lake Hell 'n Blazes would continue to accumulate muck and degrade. Habitat would continue to decline, and water quality downstream in Lake Washington would eventually be adversely affected.

2.1.2 ALTERNATIVE #2 DREDGING UPSTREAM (SOUTH) HALF OF LAKE HELL 'N BLAZES

Alternative 2 consists of hydraulically dredging the upstream half of Lake Hell 'n Blazes. Approximately 490,000 cubic yards of material would be removed from the lake. **Refer to the main report for details describing this alternative and the disposal site.** The material would be pumped a distance of over a mile to a 383-acre disposal site located northeast of the lake. The site would use the existing levee along C-2 for its western boundary. The north, south, and east boundaries would be established by small temporary two foot high berms constructed of insitu material within the disposal area. See figure 2. A weir and sump would be installed at the southwest corner of the disposal site. Excess waters would be pumped from the sump area to C-40 and would then eventually return to the headwaters of the basin. More details are in the main report in Section 4.7. There would be a decrease of approximately 129 acres of mud flats with an equal amount of exposed hard bottom and sandy area after dredging. Water depth in Lake Hell 'n Blazes would increase by up to four feet. Some areas in the bottom of the lake would likely still contain sediments. The combination of different depths of water and hard and soft substrates would provide greater opportunity for diverse habitat for a variety of fish and invertebrates. Water depths in many parts of the lake would be sufficient for use by the largest freshwater fish. Hydrilla would be removed as part of the dredging.

2.1.3 ALTERNATIVE #3 COMPLETE DREDGING OF LAKE HELL 'N BLAZES

Alternative 3 involves dredging approximately 980,000 cubic yards of unconsolidated muck from the bottom of Lake Hell 'n Blazes. **Refer to the main report for details describing this alternative and the disposal site.** The material would be pumped a distance of over a mile to a 383-acre disposal site located northeast of the lake. The site would use the existing levee along C-2 for its western boundary. The north, south, and east boundaries would be established by small temporary two foot high berms constructed of insitu material within the

disposal area. See figure 2. A weir and sump would be installed at the southwest corner of the disposal site. Excess waters would be pumped from the sump area to C-40 and would then eventually return to the headwaters of the basin. More details are in the main report in Section 4.7. There would be a decrease in water depths of approximately 258 acres of mud flats with an equal amount of exposed hard bottom and sandy area after dredging. There would be an increase of up to approximately four feet in Lake Hell 'n Blazes.

2.2 PREFERRED ALTERNATIVE(S)

The preferred alternative is number three, which involves dredging the entire area of Lake Hell 'n Blazes, providing optimum habitat enhancement.

2.3 COMPARISON OF ALTERNATIVES

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. See section 4.0 Environmental Effects for a more detailed discussion of impacts of alternatives.

Table 1: Summary of Direct and Indirect Impacts

ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative #1 No Action (Status Quo)	Alternative #2 Partially Dredge Lake Hell ' n Blazes	Alternative #3 Completely Dredge Lake Hell ' n Blazes
VEGETATION /WETLANDS	Nuisance vegetation would continue to accumulate in the lakes, no impact to disposal area	Positive impacts in lake by removal of nuisance vegetation. Temporary impact to wetlands in disposal area*	Positive impacts in lake by removal of nuisance vegetation. Temporary impact to wetlands in disposal area
PROTECTED SPECIES	Poor fisheries and habitat for wading birds and larger species such as wood storks	Positive impacts provided to fisheries may benefit wading birds, & wood storks*	Positive impacts provided to fisheries may benefit wading birds, & wood storks
FISH AND WILDLIFE RESOURCES	Fish and wildlife habitat would continue to decline	Improved habitat for fish and wildlife*	Improved habitat for fish and wildlife
WATER QUALITY	No immediate effect, water quality would continue to decline	Improved clarity, increased oxygen levels, lower nutrient levels*	Improved clarity, increased oxygen levels, lower nutrient levels
HTRW	No impact	No impact	No impact
RECREATION	Recreational fishing would continue to decline	Improvements in boating access and recreational fishing*	Improvements in boating access and recreational fishing
AESTHETICS	No impact	Temporary impact due to dredge & construction equipment	Temporary impact due to dredge & construction equipment
NAVIGATION	Limited access to boats would continue	Improved navigation*	Improved navigation
HISTORIC PROPERTIES	No impact	No archeological or historical findings likely to be present	No archeological or historical findings likely to be present
ECONOMICS	No impact	Positive impact* (Recreation, tourism)	Positive impact (Recreation, tourism)

* Impacts would be short-term due to remaining material in lake is anticipated to redistribute over entire lake within one year.

3 AFFECTED ENVIRONMENT

The Affected Environment section briefly describes the current environmental resources of the areas and the areas that would be affected if any of the alternatives were implemented.

3.1 GENERAL ENVIRONMENTAL SETTING

Lake Hell 'n Blazes is located in Brevard County, Florida, which is approximately midway down the Atlantic Coast of Florida. The lake is located in the central portion of the county, which is comprised of natural marshes and agricultural areas. Lake Hell 'n Blazes is upstream (south) of Lake Sawgrass and Lake Washington, which is the first large lake, at 2828 surface acres, in the upper St. Johns River Basin. Lake Sawgrass has 459 surface acres and Lake Hell 'n Blazes has 258 surface acres. The Upper St. Johns River Basin encompasses over 190,000 acres of wetlands (figure 1). It is one of the largest natural marshes in the state of Florida. It is a key area for the preservation of biological diversity due to the variety of habitats present and because of its large area. Currently Lake Hell 'n Blazes has poor habitat due to increased sediments. Additional information on existing conditions can be found in Section 4.1 of the Main Report.

3.2 VEGETATION

3.2.1 SOILS

The proposed disposal site is located in the SLWMA. The soils that make up this area are poorly to very poorly drained hydric soils and facultative soils. Approximately 15% of this area is comprised of hydric soils and the remaining 85% is facultative soils.

a) Hydric soils - The water table is generally within a depth of 10 inches for 6 to 12 months in most years and between 10 and 40 inches for the rest of the year. Water can stand on the surface for up to 6 months each year. These soils support vegetation that is typical of freshwater marshes which may include maidencane, sawgrass, cattail, flags, and sparse to dense thickets of buttonbush. The Chobee sandy loam and Floridana sand typically support vegetation such as sand cordgrass and swamp hardwoods and cypress cover a few areas.

b) Facultative soils - The water table is generally within a depth of 10 inches for 1 to 6+ months in most years and typically between 10 and 40 inches for up to 6 months. Water rises above the surface for 2 to 7 days from 1

to 3 months. The natural vegetation supported by these facultative soils are sand cordgrass, maidencane, saw palmetto, cabbage palm, gallberry and runner oak. On low ridges the vegetation is an open forest of slash or longleaf pine, live oak and cabbage palm with an understory of native grasses.

3.2.2 PLANT COMMUNITIES

3.2.2.1 Vegetation within Lake Hell 'n Blaz es

Native species that expand with disturbances or changes in water levels are called pioneer species such as willow (*Salix* spp.), primrose willow (*Ludwigia octovalvis/peruviana*), smartweed (*Polygonum desiflorum*), and cattails (*Typha* spp.). These species are the dominant shoreline vegetation and have little value for fisheries when in dense clumps. When native vegetation impacts navigation, water flow and habitat issues it is classified as nuisance vegetation. There are several islands present in the inflows and outflows of Lake Hell 'n Blazes. Originally, these islands were floating vegetation mats that have settled on the lake bottom since 1996 (also the shoreline contours may have changed with plant growth). A 1994 map produced by St. Johns River Water Management District (SJRWMD) indicated the following surface acreages for the headwater lakes: Lake Sawgrass (459), Lake Hell 'n Blaz es (258), Little Lake Sawgrass (79) and connecting river sections (160). A 1969 publication called the *Florida Lakes: Part III Gazetteer* had the following acreages, which included adjacent marsh: Lake Sawgrass (407), Lake Hell 'n Blaz es (381), and Little Lake Sawgrass (74). The best method would be to compare older aerial photos of the sites to approximate the historic shoreline under average water flows. These lakes have had hydrilla present since 1984 and which has historically reached 100 % coverage. This plant grows from the lake bottom up to the water surface where it extensively branches. This branching can completely fill the water column and precludes navigational access and water flow. Hydrilla forms a runner system similar to yard grass both in size and stem thickness with underground reproductive structures called tubers. The majority of these tubers, 90%, are found within 7.25 inches of the surface and the remaining 10% by 10.88 inches. The non-native floating plants water hyacinth (*Eichhornia crassipes*) and waterlettuce (*Pistia stratiotes*) are distributed throughout the upper basin system and preclude navigation under rare conditions only due to lack of treatment.

Additional information on vegetation is presented in the Fish and Wildlife coordination Act Report (CAR) located in Appendix A.

3.2.2.2 Vegetation within the proposed disposal area

The disposal area portion of the SLWMA is around 90% wetland according to 2000 vegetation maps provided by SJRWMD with only a small portion of upland located in the northwest corner. More detailed information about vegetation in the SLWMA can be found in the CAR located in Appendix A.

3.2.2.3 Plant Management

Lake Hell 'n Blazes is typically infested with hydrilla at different rates depending on the year and the amount of treatment recently received. During the year of and the year following treatment very little hydrilla is usually observed. In the past, Lake Hell 'n Blazes has been infested at rates of up to 90% when treatment has been limited. Hydrilla, as well as other invasive aquatic plants on Lake Hell 'n Blazes, is under a maintenance program that is managed by the SJWMD (website address: sjr.state.fl.us/programs/index.html) and DEP (website address: www.dep.state.fl.us/lands/invaspec/2ndlevpgs/Aquaticplants.htm). Hydrilla has been treated infrequently in the past due to it being a low priority and funding constraints. To date, treatment for Hydrilla has occurred approximately every 4 years. There is presently (spring of 2002) a treatment that is taking place on Lakes Hell 'n Blazes and Sawgrass that has nothing to do with this proposed project. This treatment is a result of the increase in funding DEP received for Invasive Species Management. However beginning in September 2002 the State of Florida will greatly increase expenditures to the invasive species program. Consequently, hydrilla treatments statewide are expected to occur on a more regular basis.

3.3 THREATENED AND ENDANGERED SPECIES

The following federally listed species may occur in the project area.

3.3.1 EAGLE

The threatened bald eagles generally nest near large rivers, lakes or estuaries where they feed primarily on fish and water-dependent birds. Nesting habitat for Bald eagles includes the nest tree, usually a live pine (*Pinus spp.*) bald cypress (*Taxodium spp.*), and perch and roost sites. In Florida, most nests are found within five miles of water.

3.3.2 AUDUBON'S CRESTED CARACARA

The threatened Audubon's crested caracara is a large, boldly patterned raptor, with a crest and unusually long legs. It is a Florida resident, diurnal, long-lived, and non-migratory. Cabbage palms and live oaks are the most often used nesting substrates (Layne, 1996). There is only one known active nest in Brevard County, at Viera.

3.3.3 WOODSTORK

The endangered wood stork is a large, long-legged wading bird. Wood storks have been documented nesting in the USJRB, in close proximity to the St. Johns Marsh Conservation Area (SJMCA). Aerial surveys conducted between 1993 and 1995 documented up to 1,300 wood storks and 296 nests in the USJRB (Hoffman, 1996). Wood storks were observed foraging in a pasture near the

project area. This species forages in freshwater marshes, seasonally flooded ditches, or almost any shallow wetland depression where fish tend to become concentrated as the area dries (Kahl, 1964). Multiple thousands of nesting pairs of wood storks were documented as being around Lakes Sawgrass and Hell 'n Blazes in the past by Dr.'s Alan and Helen Cruckshank, noted ornithologists from the area (FWC correspondence dated February 18, 2002).

3.3.4 SNAIL KITE

The endangered snail kite is a medium sized raptor that is distributed in south and central Florida. Critical habitat was designated in August 1977. The project area is not within critical habitat. Within the USJRB, snail kites are found primarily in the Blue Cypress Water Management Area, south of the Fellsmere Grade. Up to 100 birds and 60 nests have been documented (Miller et al. 1996). Snail kites have been observed in the SJMCA, presumably using the area for foraging purposes.

3.3.5 EASTERN INDIGO SNAKE

The threatened eastern indigo snake is a large, black, non-venomous snake that occurs throughout the Upper Basin Project. This species is found in a variety of habitats from pine and scrubby flatwoods, high pine, dry prairie, edges of freshwater marshes, agricultural fields, coastal dunes and human altered habitats (Moler, 1996). Eastern indigo snakes have been observed along the levees in the Three Forks Marsh Conservation Area and SJMCA.

3.3.6 WHOOPING CRANE

The endangered whooping crane measures four to five feet tall, and is the tallest bird in North America. Preferred habitat for nesting includes lake margins or among rushes and sedges in marshes and meadows where water is from 8 to 18 inches deep. When nesting marshes become dry, most cranes will forego nesting altogether (Nesbitt, 1996). Emergent vegetation such as bulrushes and cattails provide protection from disturbance by humans and terrestrial predators.

The proposed disposal area is comprised mainly of wet prairies, which have a state ecological status of S4, or uncertain state rank and are becoming increasingly rare. Wet prairies support both terrestrial and wetland species and therefore have a high potential usage by listed species. In fact, birds that are tactile feeders, such as the wood stork and roseate spoonbill, are attracted to these areas when drawdowns occur and fish populations are concentrated. Maintaining ecotonal wet prairies that exist within the SLWMA is important for the preservation of this diminishing community type and essential for preserving landscape diversity. Threatened and Endangered species that are typically found in such areas are Chaff seed, Audubon's crested caracara, Eastern indigo snake, and a variety of listed birds to include wood stork, limpkin, little blue heron, snowy egret, tricolored heron, white ibis, sandhill crane, and whooping crane.

3.4 FISH AND WILDLIFE RESOURCES

Largemouth bass telemetry investigations conducted by the Florida Fish and Wildlife Conservation Commission (FWC) have determined that Lakes Sawgrass, Hell 'n Blazes, and Washington operate as a single fishery. Spawning areas within Lake Hell 'n Blazes has been lost to the buildup of flocculent organic sediment and dense hydrilla infestation. This lake has acted as catchment basins for flocculent organic materials arising from agricultural runoff and marsh detritus, including water hyacinth and hydrilla. Lake Washington is also being adversely impacted by this sedimentation. In 1992, during a high water event, large amounts of organic sediment and hydrilla moved downstream into Lake Washington. The high biological oxygen demand (BOD) created by this event led to the death of approximately 13,000 fish along the eastern shore of Lake Washington.

Fish collected from within Lake Hell 'n Blazes include fresh water species, such as gar (*Lepisosteus spp.*), bowfin (*Amia calva*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), and black crappie (*Pomoxis nigromaculatus*). Numerous species of wading birds and ducks inhabit the lakes as well as mammals and reptiles. The US. Fish and Wildlife Service has prepared a Coordination Act Report (refer to Appendix A) that lists many of the wildlife species present in the project area.

Additional information in invertebrates, fisheries, reptiles and amphibians, avifauna, waterfowl, and mammals that inhabit the area are presented in Appendix A, the Fish and Wildlife Coordination Act Report.

3.5 WATER QUALITY

Water quality in Lake Hell 'n Blazes has been adversely impacted by organic sedimentation retention. Sedimentation has resulted in destruction of fish and wildlife habitat and the loss of spawning areas within the lake. These adverse effects are also moving downstream to Lake Washington, which serves as the potable water supply for the city of Melbourne, FL. Continued degradation by sediment impoundment facilitating hydrilla expansion would continue to decrease habitat for fisheries, possibly resulting in fish kills, and eventually compromising the water quality of Lake Washington. In a study by Azurea, Inc., examination of the data in tabular form and shown on the graphs of sedimentation rates through time for the most complete core samples indicate that high sedimentation rates were frequently associated with flood events and/or physical disturbance. Apparently sedimentation has stabilized or even slowed in Lake Hell 'n Blazes during the last 10 to 15 years while sedimentation has steadily increased in the north end of Lake Washington. This confirms that the upper lakes, Hell 'n Blazes

and Sawgrass, are nearly full and more sediments are being transported into Lake Washington.

3.6 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

In 1994, Azurea, Inc. and Environmental Laboratories, Inc. were contracted to collect and chemically analyze sediments from Lake Hell 'n Blazes. This was to determine if the sediments in these lakes could be safely moved to an upland disposal site. They were analyzed for heavy metals content and selected pesticide concentrations.

Three samples were taken in each lake and the average results are shown in Table

2. All samples of heavy metals were below the No Observable Effect Level (NOEL). These results indicate that the heavy metal contaminants are not present in levels that exceed the U.S. Environmental Protection Agency (EPA) Region IV Sediment Screening Criteria for hazardous waste sites, or the Florida Department of Environmental Protection (FDEP) Soil and Sediment Cleanup Goals Criteria. Therefore, it has been determined the excavation and placement of these materials should not cause degradation of water quality or the disposal site. All pesticides tested were below detectable levels.

Table 2

Average results of analysis of three core samples each from Lake Hell 'n Blazes

	Lake Hell 'n Blazes
Bulk Density	0.177 g/
Water Content	84.167 %
Volatile Solids	40.63
Lead	6.8 µg/g
Cadmium	0.14 µg/g
Copper	17.33 µg/g
Arsenic	2.8 µg/g
Chromium	5.9 µg/g
Mercury	< 0.1 µg/g

*All chlorinated hydrocarbon and organophosphate pesticides tested were below detectable levels.

3.7 RECREATION AND NAVIGATION

As previously discussed, the lake is used for recreational fishing and boating. The coverage of hydrilla impacts the ability of small motorboats to access the lake. Also, the amount of water in the system impacts navigation. During low water periods, the lake is not navigable by outboard motorboats. Airboats are required to access most of the shoreline during low water periods and heavy hydrilla infestations.

3.8 HISTORIC PROPERTIES

The Florida peninsula has been occupied by humans for at least 12,000 years. Extensive occupation of the project area began during the Middle Archaic period, about 5,000 B.C. A reconnaissance level cultural resources survey was conducted within the Upper St. Johns River flood control project (Campbell et. al. 1984). The survey did not investigate this project area, but predictions can be made from their investigations nearby. Campbell et al. found that pre-Columbian archeological sites are found predominately in oak-palm hammocks and hackberry-cabbage palm hammocks, and on undifferentiated flatwoods. Recorded sites include 8BR20 between Sawgrass Lake and Lake Hell 'n Blazes and 8BR21 east of Lake Hell 'n Blazes. Neither of these sites will be affected by the project. Additional sites include 8BR22, soil banks along C-1 at SE corner of Section 30 and 8BR214, Bull Head Hammock at NE corner of section 30 close to the proposed berm. 8BR214 may be impacted by construction of the berm for the disposal site. Coordination with the State Historic Preservation Office (SHPO) is ongoing.

4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. See table 1 in section 2.0 Alternatives, for summary of impacts. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

4.1 GENERAL ENVIRONMENTAL EFFECTS

The general environmental effects from this project involve improvements the waters, shorelines, and bottom of Lake Hell 'n Blazes. These waters provide essential habitat for diverse flora and fauna, such as fish and invertebrate populations; birds and wildlife; as well as endangered and threatened species. Additional information on effects can be found in the Main Report.

4.2 VEGETATION

4.2.1 IMPACTED AREAS

Two areas where vegetation would be affected are in the lake itself and in the disposal area. The lake is inhabited by invasive vegetation (mainly hydrilla) that has negatively impacted sports fish productivity. To date, the spring 2002 treatments have been effective in removing the plant biomass from Lake Hell 'n Blazes. In the preferred alternative, Alternative 3, root crowns and tubers would be removed along with the muck (approximately 980,000 cubic yards) from Lake Hell 'n Blazes. Removal of the nuisance vegetation and muck would allow natural recruitment of vegetation to occur. Once the hydrilla, hydrilla tubers, and hydrilla turions are removed the seed source and reproduction potential of hydrilla would be greatly reduced. With reduced nutrients in the water column and soil (since the lake would be dredged down to fibrous peat), the hydrilla should come back more slowly. Also, as mentioned in the previous section on vegetation (section 3.2), the State of Florida, beginning in 2002, has increased funding to its invasive species program; therefore, hydrilla treatments statewide are expected to occur on a more regular basis. The lake would also be a higher priority to the State for treatment due to its increased environmental and recreational values if this project were implemented. With increased management, more diverse aquatic plant community(ies) would be expected to develop within the lake. The hydrilla could be treated prior to dredging. This would eliminate the need to place it in an alternative disposal site and it would be more cost effective than dredging and transporting. Treatments would need to be coordinated with DEP for timing and cost. It would take approximately one month for the plants to fall out and

decompose before effective dredging could occur. The dredged material would most probably have many tubers, which would be viable and could cause infestations in the disposal site. This is addressed as an operation and maintenance issue in the main report, Section 6.2 Operations and Maintenance section.

In alternative #2, which involves dredging only the upstream half of Lake Hell 'n Blazes, there would be less invasive vegetation and muck (approximately 490,000 cubic yards) removed since only half of the lake would be dredged. The remaining muck would likely be redistributed over the dredged area within one year, negating the project benefits. Based on results from similar projects and other available information, dredging half or less of the area of the lake would substantially reduce the level of ecosystem benefit and/or the duration of that benefit.

The second area of impact is the proposed disposal site. If action is taken, this area would be covered with unconsolidated muck, hydrilla, hydrilla tubers, and hydrilla turion. The disposal area is currently a wetland within the SLWMA. If the project is initiated while vegetation remains in its existing condition, then the character of the wetlands in the disposal area would change from a mineral soil wetland dominated by various grasses and sedges (as described in the CAR located in Appendix A), to one covered with unconsolidated muck that would eventually develop into a flag marsh (personnel from FWC have indicated that the lake sediments have a seed-bank dominated by flag species). (Project must be complete before the SLWMA is reflooded to keep from interfering with the function of the SLWMA). Hydrilla may benefit the function of the SLWMA as a treatment wetland.

The addition of the dredged material into the disposal site would facilitate use of the area as a future water treatment area as the disposal site has desirable topographic characteristics for this purpose (i.e. it's low in the proposed disposal area). Further, construction berms would be leveled to the height of the dredged material following completion of the project to be consistent with the topography needed for the future treatment area. Therefore, wetlands would not be permanently lost as a result of the project.

Under the no action alternative, there would be no muck or vegetation removed, no improvements performed in the lakes, and therefore no impact to vegetation in the disposal area. Without treatment, non-native vegetation in the lakes would continue to overtake the lakes in the upper basin.

year, negating the project benefits. Based on results from similar projects and other available information, dredging half or less of the area of the lake would substantially reduce the level of ecosystem benefit and/or the duration of that benefit.

Under the No action alternative, fish and wildlife habitats in the lake would continue to decline.

Additional detail about anticipated impacts that the alternatives may have on fish and wildlife resources is presented in the CAR located in Appendix A.

4.5 WATER QUALITY

The proposed action would not adversely impact the existing water quality and would be in compliance with all Federal and State of Florida water quality requirements. Water quality would be improved within the area by the stabilization of sediments. Contaminants would not be introduced from the existing muck and invasive vegetation (mainly hydrilla) when moved to the disposal area outside the lake. Short-term increases in turbidity are expected during the removal and disposal operations phase of the project. Following project completion, improvement in fish and wildlife populations, dissolved oxygen levels, and other water quality conditions, should be readily visible. There should be additional measurable improvements in water quality and physical conditions including decreased turbidity levels. Without the restoration of Lake Hell 'n Blazes, Lake Washington can expect to be impacted by increased sedimentation loads resulting in a degradation of water quality. If these two lakes are dredged, they would again provide valuable habitat for fish and wildlife resources and cease to have detrimental impacts on Lake Washington. This would improve water quality and greatly enhance the ecosystem habitat in the three-lake system.

4.6 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

Preliminary research (background information, literature search, etc) revealed that no known sources of HTRW materials exist in the directly impacted portions of the project area. The following signs of potential HTRW problems were not identified: landfills, non authorized dumps and disposal areas; burning or burned areas, underground basins, pits, quarries and borrow areas, wells; containers, odors, stressed or dead vegetation; water treatment plants; buildings; and transport areas, such as boat yards, harbors, airports and truck terminals. No sites with potential for contamination with HTRW were found. Additional trip reports, photos and other documentation are on file in CESAJ-PD-EP, Jacksonville District Office.

4.2.2 MANAGEMENT PLAN

Currently the state manages exotic and nuisance vegetation in Lake Hell 'n Blazes (as previously discussed in section 4.2.1). The Upper St. Johns River Basin project, when completed with the construction of the SLWMA, will greatly contribute to maintenance of the proposed project. See section 6.2 of the main report for more information on operation and maintenance of the project.

4.3 THREATENED AND ENDANGERED SPECIES

The following chart is a summary of effects on listed species. More information on effects to listed species can be found in the CAR located in Appendix A.

	Dredging of Lake	Material placed into disposal area	No action
Bald eagle	No effect	No effect	No effect
Audubon's crested caracara	No effect	No effect	No effect
Woodstork	No effect	No effect	No effect
Snail kite	No effect	May be used for foraging purposed	No effect
Eastern Indigo Snake	No effect	Species will have to relocate	No effect
Whooping crane	Increased nesting habitat anticipated	No effect	No effect

Table 3 – Effects to Listed Species

4.4 FISH AND WILDLIFE RESOURCES

The preferred alternative presents optimum potential for improvement to fish and wildlife habitat and the restoration of fish spawning areas. If muck is completely removed from the lake, this would allow valuable habitat for fish and wildlife resources to improve in the three-lake system (Lakes Sawgrass, Hell 'n Blazes, and Washington). The dredging should also open the firm peat or sand to colonization by desirable invertebrates. These invertebrates would provide increased food for wading birds and dabbling ducks. Removal of the unconsolidated muck may also create soil conditions suitable for the re-establishment of native submersed aquatic plants. Partial dredging of either lake would not provide substantial benefits to fisheries based on the assumption that the undredged material left in the lakes is likely to spread to the dredged area.

In alternative #2, which involves dredging only the upstream half of Lake Hell 'n Blazes, there would be less invasive vegetation and muck (approximately 490,000 cubic yards) removed since only half of the lake would be dredged. The remaining muck would likely be redistributed over the dredged area within one

4.7 RECREATION AND NAVIGATION

Complete dredging of the lake would have a positive impact on recreation and navigation due to increased boating access that would be provided when the hydrilla and muck is removed from the lakes. Partial dredging would provide limited benefits, because as previously stated, it is predicted that remaining material in lake would likely redistribute over the dredged area within one year. If no action is taken, recreational fishing would decline as fish habitats continued to degrade and access to the lakes becomes more difficult.

4.8 AESTHETICS

Implementation of action alternatives would require use of heavy equipment for the duration of the work that would have a temporary negative impact on the aesthetics (visual resources) of the project area.

4.9 HISTORIC PROPERTIES

No historic properties listed on or eligible for listing on the Nation Register of Historic Places are recorded within the project area. In a letter dated March 7, 2001, the Florida State Historic Preservation Officer gave an opinion that a cultural resources survey should be performed prior to construction. Those areas that were not reviewed by Campbell et al. during their investigations will require additional surveys prior to any construction activities. Coordination with the SHPO is being completed.

4.10 SOCIO-ECONOMICS

Alternative three would have a positive impact on economics due to increased recreational opportunities that would be provided for fisheries by completely dredging the lake.

No action and partial dredging would lead to negative impacts due to decreased recreational fishing. This would be anticipated due to declining fisheries in the degrading lakes and also access to the lakes will become more difficult due to vegetation and sedimentation buildup.

4.11 CUMULATIVE IMPACTS

Efforts to locate disposal sites outside of the SLWMA were unsuccessful. Based on this information, temporary impacts on wetlands would occur at the disposal site. The muck will be going into depressions formed by previous agricultural activities at no more than 2 feet in depth. This muck will consolidate with exposure to air. Since the current plan is to remove the berm, then no long-term impact to wetlands is anticipated. Section 4.2 of the main report describes future additional plans for the SLWMA proposed in the C-1 Re-diversion Project.

4.12 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

4.12.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and this Environmental Assessment has been prepared. The project is in compliance with the National Environmental Policy Act.

4.12.2 ENDANGERED SPECIES ACT OF 1973

This project has been coordinated with USFWS and is in full compliance with this Act.

4.12.3 FISH AND WILDLIFE COORDINATION ACT OF 1958

This project has been coordinated with the U.S. Fish and Wildlife Service (USFWS). A CAR dated March 2002 was submitted by the USFWS. Changes in the project have been coordinated with USFWS service. This project is in full compliance with the Act.

4.12.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

(PL 89-665, the Archeology and Historic Preservation Act (PL 93-291), and executive order 11593) Archival research, reconnaissance level cultural resources survey, and consultation with the Florida State Historic Preservation Officer (SHPO), have been conducted in accordance with the National Historic Preservation Act, as amended; the Archeological and Historic Preservation Act, as amended and Executive Order 11593. SHPO consultation was initiated December 20, 2000. In a March 7, 2001 response, the SHPO advised that additional survey may be required. No historic properties included in or eligible for inclusion in the National Register of Historic Places are recorded in the project area. The project is in partial compliance with each of these Federal laws. Coordination with the SHPO is being completed.

4.12.5 4.35.5 CLEAN WATER ACT OF 1972

The project is in compliance with this Act. A Section 401 water quality certification will be applied for and obtained from DEP prior to any work being done. All State water quality standards would be met. A Section 404(b) evaluation is included in this report as Appendix B.

4.12.6 CLEAN AIR ACT OF 1972

No air quality permits would be required for this project.

This draft EA will be coordinated with U.S. Environmental Protection Agency (EPA) to insure compliance with Section 309 of the Act.

4.12.7 COASTAL ZONE MANAGEMENT ACT OF 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix C.

4.12.8 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland would be impacted by implementation of this project. The project complies with this act.

4.12.9 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic river reaches would be affected by project related activities. This act is not applicable.

4.12.10 MARINE MAMMAL PROTECTION ACT OF 1972

The work would not impact marine mammals in the area; therefore, this project is in compliance with the Act.

4.12.11 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by project activities. This act is not applicable.

4.12.12 FEDERAL WATER PROJECT RECREATION ACT

The project is in full compliance at this stage of planning.

4.12.13 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

Marine waters or resources under the jurisdiction of NMFS are not impacted by this project. This act is not applicable to this project.

4.12.14 SUBMERGED LANDS ACT OF 1953

The project would occur on submerged lands of the State of Florida. The project has been and will continue to be coordinated with the State and is in compliance with the act.

4.12.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area. These acts are not applicable.

4.12.16 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The project is in full compliance.

4.12.17 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected. Marine waters or resources under the jurisdiction of NMFS are not impacted by this project. The project is in compliance with the act.

4.12.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

No migratory birds would be affected by project activities. The project is in compliance with these acts.

4.12.19 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

Marine resources would not be involved in this work; therefore, this Act does not apply.

4.12.20 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

This act does not require preparation of an Essential Fish Habitat (EFH) Assessment as determined through coordination with the National Marine Fisheries Service.

4.12.21 E.O. 11990, PROTECTION OF WETLANDS

As discussed in the draft EA and the U.S. Fish and Wildlife Service's Fish and Wildlife Coordination Act Report (Appendix A), wetlands would be impacted by disposal activities. However, practicable disposal alternatives were not identified during the study.

4.12.22 E.O. 11988, FLOOD PLAIN MANAGEMENT

The project would not involve construction of structures within the floodplain nor restrict flow through the floodplain. Therefore, the project is in compliance with this Executive Order.

4.12.23 E.O. 12898, ENVIRONMENTAL JUSTICE

The proposed project would not result in adverse human health or environmental effects, nor would the activity impact the subsistence consumption of fish and wildlife. The project is in compliance with this Executive Order.

4.12.24 E.O. 13089, CORAL REEF PROTECTION

The proposed project would not result in adverse impacts to coral reef ecosystems. This Act is not applicable.

4.12.25 E.O. 13112, INVASIVE SPECIES

The work would not spread or introduce invasive species into any new area. The hydrilla would be treated prior to being deposited into the disposal site. Also,

hydrilla is already present in the disposal site so the proposed work would not spread or introduce hydrilla into any new area. The work has already been (as much as appropriate at this stage of planning) coordinated with the State to insure compliance with its on-going invasive species program. The work is in compliance with this Executive Order.

5 LIST OF PREPARERS

5.1 PREPARERS

Catherine Byrd, Biologist, USACE
Olice Carter, Biologist, USACE
Jimmy Hadden, Biologist, USACE
Liz Manners, Biologist, USACE
David McCullough, Archeologist, USACE
Steven Robinson, Civil Engineer, USACE
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Jimmy Matthews, Civil Engineer, USACE
Steve Miller, Environmental Scientist, SJRWMD
Don Palmer, Biologist, USFWS
Kim Ponzio, Environmental Scientist, SJRWMD
Paul Stodola, Biologist, USACE

6 PUBLIC INVOLVEMENT

6.1 SCOPING AND EA

A Scoping letter was mailed out on December 20, 2000. A copy of the scoping letter, mailing list, summary of responses, and response letters received to the scoping letter are presented in Appendix D.

6.2 AGENCY COORDINATION

The proposed project has been or will be coordinated with the following agencies: St. Johns River Water Management District, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Florida State Clearinghouse, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, and Florida State Historic Preservation Officer. Agency coordination letters are in Appendix D.

6.3 COMMENTS RECEIVED AND RESPONSE

Letters of comment on this Draft EA will be attached to the Final EA. The EA and unsigned FONSI will be sent out for review by the public for 30 days before a determination is made of whether or not the FONSI will be signed by the CE District Engineer. The EA and FONSI will be sent to those who have expressed an interest in receiving a copy, otherwise they will be made available to the public by Notice of Availability.

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APPENDIX A – FISH AND WILDLIFE COORDINATION ACT REPORT



United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive South
Suite 310
Jacksonville, Florida 32216-0958

IN REPLY REFER TO:
FWS/R4/ES-JAFL

August 1, 2002

Mr. James C. Duck
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Attn: Ms. Catherine Byrd

FWS Log No: 02-1289

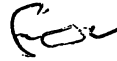
Dear Mr. Duck :

The U.S. Fish and Wildlife Service has reviewed the project plans and provided a Fish and Wildlife Coordination Act Report for the 206 restoration project on the St. Johns River, Brevard County.

The Corps evaluated the affect the Lake Sawgrass and Hell 'n Blazes Section 206 restoration project in Brevard County would have on the bald eagle, wood stork, and eastern indigo snake, and determined may affect, but not likely to adversely effect. Our comments are submitted in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). Based on our review of the project, the Service concurs with the Corps' determination.

Although this does not represent a biological opinion as described in section 7 of the Endangered Species Act, it does fulfill the requirements of the Act and no further action is required. If modifications are made in the project or additional information becomes available on listed species, reinitiation of consultation may be required.

Sincerely,

A handwritten signature in black ink that reads "Don Palmer". The signature is written in a cursive style with a large, prominent "P" and "M".Handwritten initials in black ink, appearing to be "PMB".

Peter M. Benjamin
Assistant Field Supervisor

S: palmer\02-1289\acm\08.01.02



United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive South
Suite 310
Jacksonville, Florida 32216-0958

IN REPLY REFER TO:
FWS/R4/ES-JAFL

August 22, 2002

Mr. James C. Duck
Chief, Planning Division
Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Attn: Catherine Byrd

Dear Mr. Duck:

This responds to your letter of August 12, 2002, requesting our comments on another alternative for dredging Lakes Sawgrass and Hell'n Blazes, Brevard County. The new alternative calls for only dredging the south half of Lake Hell'n Blazes and the west half of Sawgrass Lake. The disposal site has not changed. We do not believe this alternative changes our findings in the Service's Fish and Wildlife Coordination Act Report recently submitted to the Corps.

We appreciate the opportunity to provide our comments. For further coordination, please contact Don Palmer in this office.

Sincerely,

for Peter M. Benjamin
Assistant Field Supervisor

S: palmer\sawgrass\acm\08.22.02

FINAL REPORT

SECTION 206

LAKES SAWGRASS AND HELL'N BLAZES

RESTORATION PROJECT

BREVARD COUNTY, FLORIDA

U.S. Fish and Wildlife Service
Coordination Act Report

March 2002

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1.0 INTRODUCTION

This US Fish and Wildlife Service (USFWS) Coordination Act Report (CAR) is submitted at the request of the Army Corps of Engineers, Jacksonville District (Corps). The purpose of the CAR, as specified in the Scope of Work, is to provide information evaluating: a). existing environment including fish and wildlife resources and their habitat, threatened and endangered species, vegetation, and other sensitive or appropriate environmental resources; and b). environmental effects (both positive and negative) of the alternatives on vegetation, fish and wildlife resources and habitat, threatened and endangered species, and other sensitive or appropriate environmental resources. This project is authorized under Section 206 of the Water Resources Development Act of 1996, as amended.

2.0 BACKGROUND

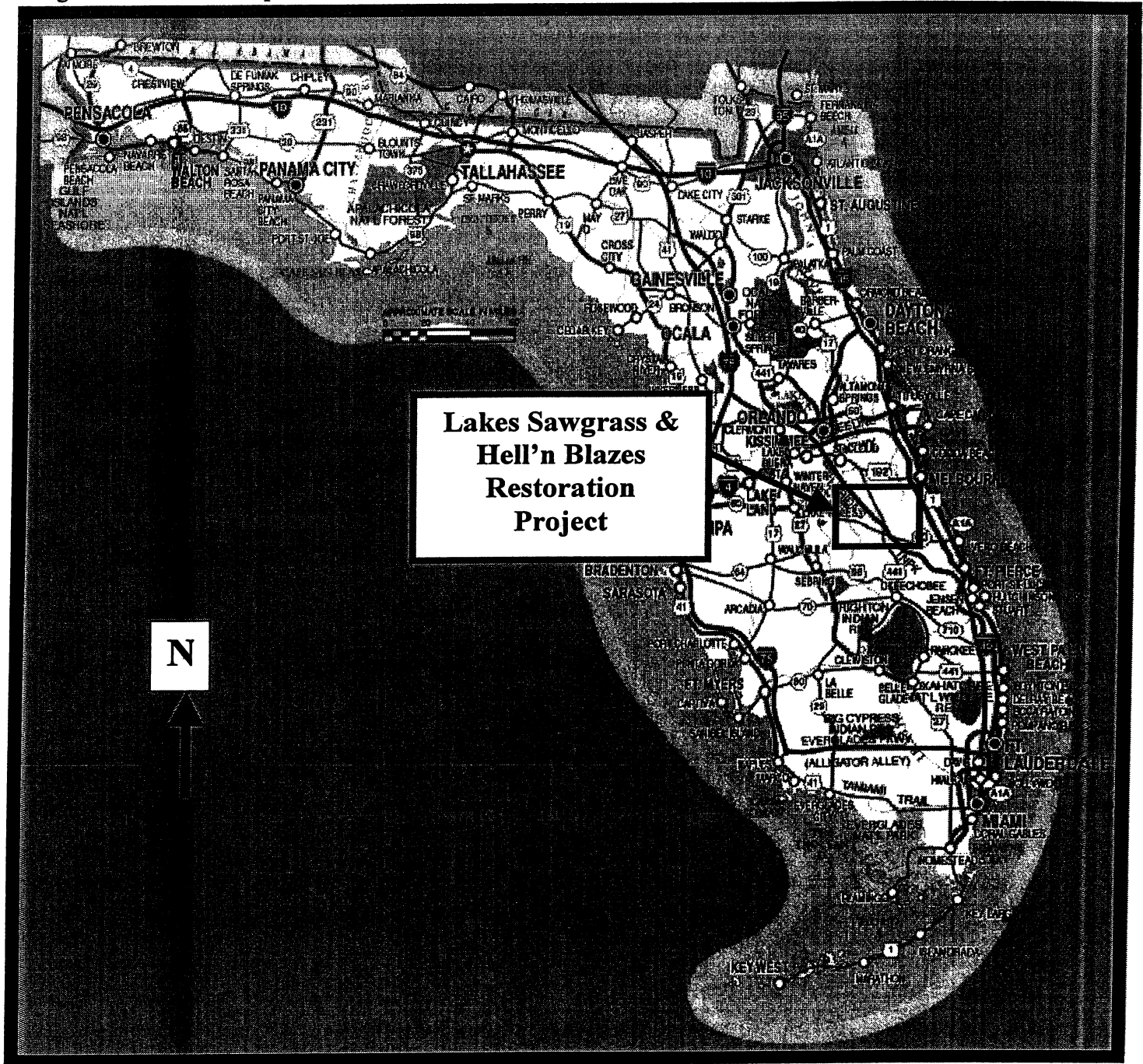
The USJRB is a 2,000 square mile flood control project (Upper St. Johns River Basin Project (USJRBP)) constructed in partnership by the Corps and the St. Johns River Water Management District (SJRWMD). The project is designed to provide major flood damage reduction and recreation benefits, including preservation and restoration of over 150,000 acres of wetlands and improvement of basin-wide water quality. To achieve environmental objectives, they are attempting to restore the natural hydrologic regime that shaped the upper St. Johns River basin ecosystem to the greatest extent possible. By creating a hydrologic regime that mimics natural cycles, optimum soil and vegetation characteristics will be maintained. In turn, this will help provide other environmental benefits such as enhanced fish and wildlife habitat and improved water quality.

The USJRB is a complex landscape of marshes, swamps, lakes, and streams encompassing over 190,000 acres of wetlands. Lakes Sawgrass (SG) and Hell'n Blazes (HB) are located within the USJRB, and are the first two lakes within the headwaters of the St. Johns River. Lake Washington (4,362 acres), which is the next lake downstream of Lakes SG and HB, is the first large lake in the basin and is the potable water supply for the city of Melbourne. This three lake system was previously renowned for its excellent bass fishing. Agricultural encroachment now occupies more than 70% of the upper basin flood plain draining into lakes HB (260 acres) and SG (463 acres), and has significantly impacted the lakes aquatic habitat and fisheries.

3.0 PROJECT LOCATION

Lakes SG and HB are located in Brevard County, Florida, which is approximately midway down the Atlantic Coast of Florida. The study area is approximately 20 miles southwest of Cocoa Beach or 45 miles southeast of Orlando, Florida, or 15 miles west of Melbourne; the study area is shown in Figure 1. The two lakes are located in the central portion of the county, which is comprised of natural marshes and agricultural areas. These lakes are upstream (south) of Lake Washington, which is the first large lake in the USJRB.

Figure 1: Location Map



The future 2,240 acre Sawgrass Lake Water Management Area (SLWMA) is located in Brevard County, Florida, within the SJRWMD. It is located in the USJRB almost directly south of Titusville and Lake Washington, southeast of SG Lake and east of Lake HB and the St. Johns River. SLWMA is approximately 1 mile wide and 3.5 miles long. As part of the proposed C-1 Rediversion Project, SLWMA will be established as a created wetland to treat storm-water runoff from the city of Palm Bay that will be pumped from the Melbourne-Tillman Canal (C-1), near Melbourne. Currently, the C-1 canal drains eastward to the Indian River Lagoon (IRL) causing unacceptable harm to lagoon biota due to large concentrations of pollutants and high freshwater inflows. A spillway structure will be built on the C-1 canal that will significantly reduce flows to the lagoon, redirecting a large percentage of storm-water westward to the upper St. Johns River. In order to prevent nutrient and pollutant impacts to the St. Johns River, the runoff will be pumped through the SLWMA for treatment.

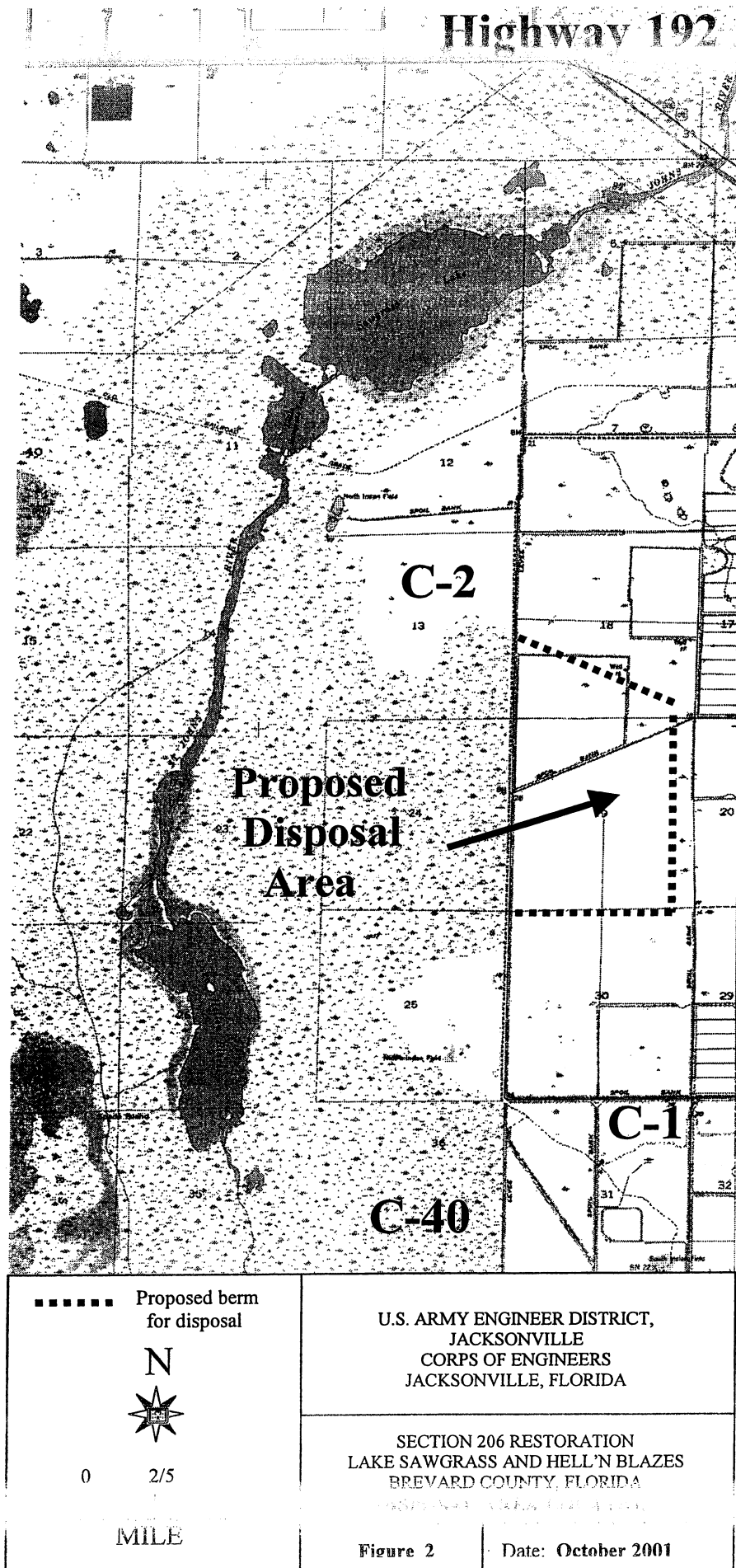
4.0 PROJECT DESCRIPTION

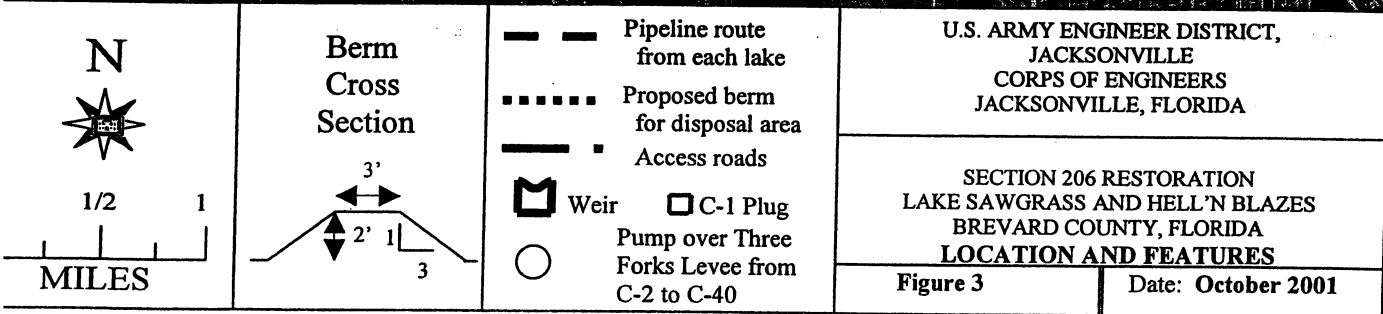
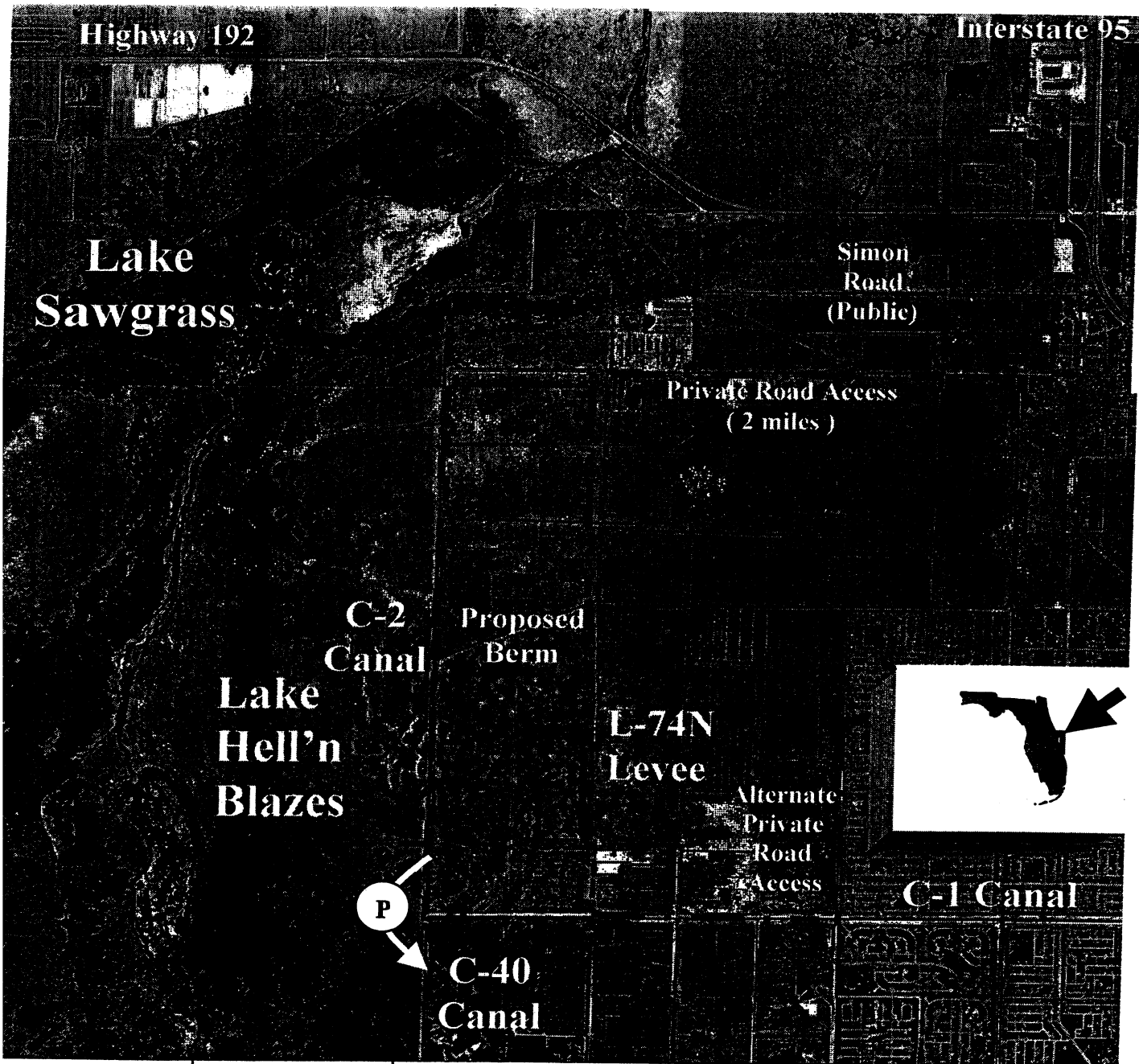
The proposed project involves the partial restoration of Lakes SG and HB, two lakes within the USJRB that have been adversely impacted by high sedimentation, destruction of fish and wildlife habitat, and degraded water quality conditions. Conditions within these two lakes have been declining since the 1960's.

The proposed work would consist of removal of approximately 1,200 acre-feet (2.0 million cubic yards) of unconsolidated muck from the bottom of the two lakes using a hydraulic dredge. There are approximately two (2) feet of muck in Lake Sawgrass and Lake Hell'n Blazes, respectfully which will be removed during this project. This dredged material would be pumped into a disposal area, approximately 805 acres in size, and located within the SLWMA. The disposal area will be located in the central-western area of the SLWMA. The SLWMA and the disposal area are comprised of drained lands previously used for pasture and are shown in Figures 2 & 3. A temporary disposal area berm will be constructed using insitu material and will be 2 feet in height with a 1 foot (vertical) to 3 feet (horizontal) slope and a 3-foot crest. The dredged material (muck) will be pumped into the northwest corner of the disposal area. A plug would be installed in the C-1 canal near its junction with the C-2 canal. Effluent would discharge over the weir and flow south along C-2. From C-2, water would be pumped over the levee at the junction of C-1, C-2 and C-40 into C-40 to eventually return to the headwaters of the St. Johns River. The berm, plug, pump and weir will be removed after disposal is complete. The SLWMA, with the 2-foot high bermed disposal area, will ultimately be managed as a wetland with a water depth of 18 to 24 inches (USACE, 1999).

5.0 PROJECT ALTERNATIVES

The No Action alternative will be more thoroughly evaluated during the feasibility phase of this project. Other alternatives to be considered during the feasibility phase would





consist of removing bottom sediment from one or both lakes. Alternate disposal sites were considered; pumping distances and truck hauling alternatives proved too costly to be justified.

6.0 AFFECTED ENVIRONMENT

6.1 HISTORIC

The USJRB, located in east, central Florida, includes most of Indian River and Brevard Counties, and portions of Orange, Volusia, Osceola, Seminole, and St. Lucie Counties. The upper basin consists of approximately 2,000 square miles, bounded by the Atlantic coastal ridge to the east and the Kissimmee River basin to the west. The upper basin is about 83 linear miles long (north and south) and about 11 miles wide (east and west). The elevation drop averages one-foot in every five miles. This low gradient and large floodplain allows the USJRB basin to function as a natural storage area to maintain flow during periods of low rainfall and to serve as a natural regulator of surface water stages during periods of high and low flow. The headwaters of the St. Johns River are in the St. Johns Marsh in St. Lucie, Okeechobee, and Indian River Counties, separated from the saline Indian River by a sand ridge (USFWS, Draft CAR). The average elevation of the marsh varies from 24 feet near Blue Cypress Lake to 12 feet near Lake Poinsett. An important feature of the upper basin is the Fellsmere Grade, an abandoned roadbed that crosses the southern Brevard County line and exerts a hydroperiod effect on the basin.

In pre-Pamlico times, the St. Johns River Valley was a brackish water lagoon lying east of the Florida coast and bordered on the east by offshore bars. Sands shifting southward gradually filled in between these offshore bars, and the waters in the valley began to freshen and drain northward. The vegetation in the Indian River and its marshes, slowly gave way to the present fresh water marsh vegetation (USFWS, Draft CAR).

The USJRB receives the majority of its rainfall during a four-month period, June through September, and under predevelopment conditions, about 289,200 acres of marsh would be inundated. However, the vegetative communities in the basin have been altered as a result of human intervention. Vast sections of the marsh have been diked and water pumped out of the area to create suitable land for agriculture. As more and more diking and drainage occurred, the storage capacity decreased and flood peaks increased, necessitating the construction of conveyance channels within the marsh to move water rapidly away from the areas of agriculture (USFWS, Draft CAR). As a result of agricultural practices in the basin and the reconfiguration of water pathways, vast areas of the marsh have undergone drastic changes. In the SLWMA, draining has resulted in soil subsidence and the invasion of plants more adaptable to less wet conditions. The soil loss is due primarily to oxidation of the highly organic peat soils that underlie most of the SLWMA after they were drained. The USJRB is an "altered ecosystem".

6.2 CURRENT CONDITIONS

6.2.1 Vegetation. Much of the information presented in this subsection was compiled by the SJRWMD, included in the Upper Saint Johns River Basin and Related Areas; Supplement 2, General Design Memorandum (GDM), Upper St. Johns River Basin Addendum III with Draft Environmental Impact Statement (DEIS)

6.2.1.1 Lakes Sawgrass and Hell'n Blazes. Lakes SG (463 acres) and HB (260 acres) are the first two lakes within the river proper and the headwaters of the St. Johns River. In a 1994 survey conducted by the Florida Department of Environmental Protection, hydrilla (*Hydrilla verticillata*) infestation in Lakes SG & HB was 88.45% and 91.86% respectively. The amount of hydrilla in Lake HB has decreased in the last six to eight months. In Lake SG, coontail (*Ceratophyllum demersum*) has also recently been observed invading the same areas as the hydrilla. Along the edges of the lakes willow (*Salix sp.*), button bush (*Cephalanthus occidentalis*) elderberry (*Sambucus canadensis*), wax myrtle (*Myrica cerifera*), and the invasive Brazilian pepperbush (*Schinus terebinthifolius*) are present. Herbaceous vegetation includes species such as water hyacinth (*Eichhornia crassipes*), cattail (*Typha sp.*), maidencane (*Panicum hemitomon*), giant bristlegrass (*Setaria magna*), barnyard grass (*Echinochloa crusgalli*), and pokeberry (*Phytolacca americana*). Over time, when large mats of floating aquatic vegetation become dislodged from still larger areas of floating aquatic vegetation, they form "floating" islands. Prevailing winds and currents move these floating islands to other areas of the lakes.

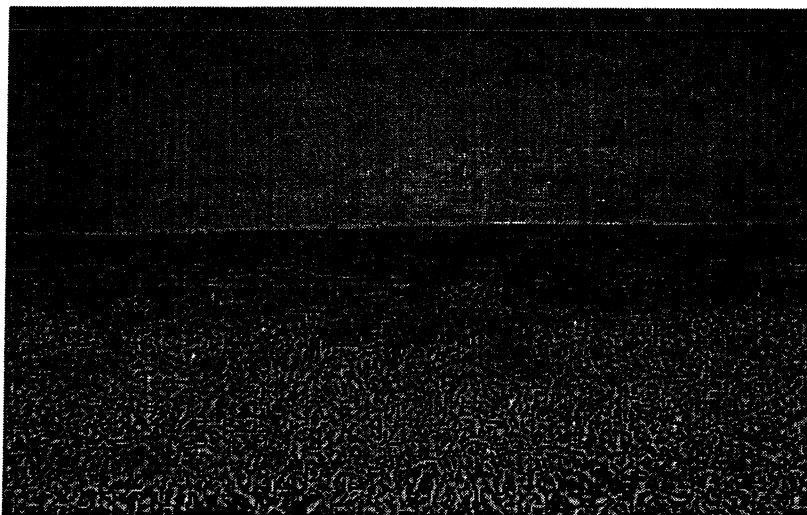


Photo 1: Lake Hell'n Blazes



Photo 2: Lake Sawgrass

6.2.1.2 Lake Washington. Lakes SG and HB, were historically two of the premier fishing lakes in the State of Florida. Channelization, floodplain loss, increased nutrient loadings and encroachment of nuisance aquatic plant species within the basin caused organic sediments to accumulate rapidly on the bottom of these lakes during the past few decades. As a result, fish spawning habitats were lost, dissolved oxygen levels became undesirable, and sport fish numbers declined dramatically. In addition, because the capacity of these lakes to store sediments was decreased, more organic sediments began being transported downstream into Lake Washington. Subsequently, the quality of Lake Washington began to decline. The first fish kill ever reported in Lake Washington occurred during very high water levels in the spring of 1992 when a large quantity of organic sediment (hydrosol) and hydrilla moved downstream from Lakes SG & HB. The high oxygen demand (BOD) created by this event led to a fish kill (approx. 13,000 fish) along the eastern shore of Lake Washington. Lake Washington is the primary municipal water supply for the city of Melbourne.

6.2.1.3 SLWMA. The 2,240-acre SLWMA has been used for agriculture purposes including cattle grazing and farming (see Photos 3 & 4). With the exception of the southeast corner of this area, the predominant vegetative cover of the southern half of the SLWMA is grass/sedge marsh with large expanses of *Spartina* marsh interspersed with cabbage palm hammocks, and mixed herbaceous marsh. The *Spartina* marsh consists of predominantly sand cordgrass (*Spartina bakerii*) with soft rush (*Juncus effuses*) and other shallow water plants as minor components. The southeast corner of the SLWMA is primarily in a transitional shrub cover interspersed with patches of pasture, mixed herbaceous marsh, grass/sedge marsh and cabbage palm hammocks. The northern half of the SLWMA is predominantly pastureland, part of which has been abandoned. This pastureland is interspersed with mixed herbaceous marsh and includes areas of grass/sedge marsh, transitional shrub and cabbage palm hammocks in the southwestern corner. The northwestern corner includes transitional shrub and oak hammock vegetative cover, which consists of greater than 70% live oak coverage. The establishment and

management of this area as a wetland will require maintaining 18 inches to 2 feet of water in the cells (SJRWMD, verbal communication, 2001). During dry periods, this is expected to be accomplished by recirculating water between the C-1 Retention Area and the SLWMA. This will be accomplished by opening a low flow culvert that is located at the southwestern corner of the SLWMA in the west end of the C-1 North Levee. This culvert allows water to flow from the exiting C-2 Canal along the western boundary of the SLWMA and discharge into the C-1 canal. The C-1 pumps will then pick the water up and discharge into the SLWMA cells. Recirculation rates will vary from 45 cfs to 10 cfs (SJRWMD, personal communication, 2001).



Photo 3: Sawgrass Lakes Water Management Area

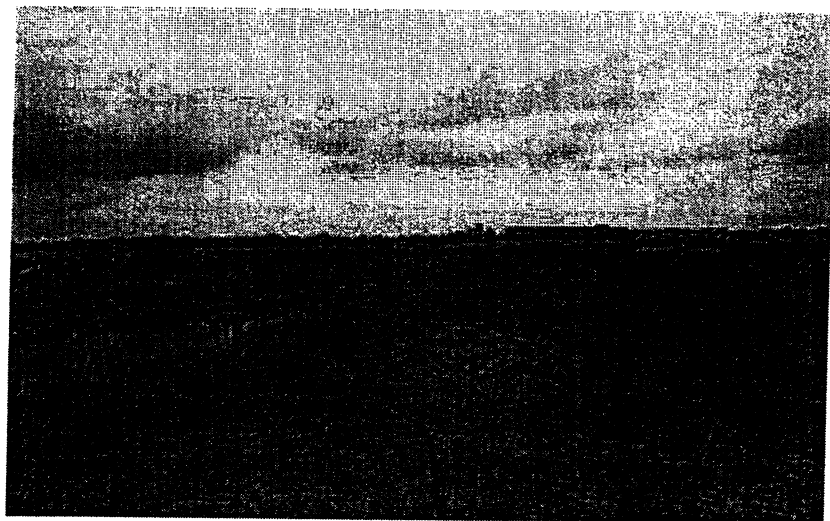


Photo 4: Sawgrass Lakes Water Management Area

6.2.1.4 St. Johns Marsh Conservation Area. The SJMCA consists of approximately 34,300 acres of freshwater marsh, pasture, forested wetlands, and shallow lakes lying between the Levee 74W and US 192 (See Photos 5 & 6). The northern portion of the SJMCA which pertains to this project and contains Lakes SG and HB, is bordered to the east by the SLWMA and the C-1 Retention Area. The SJMCA was an extension of the SLWMA until Levee 74W was constructed. Consequently, vegetative cover offers some similarities. Cover on the SJMCA includes *Spartina* marsh interspersed with sawgrass (*Cladium jamaicense*), saltbush (*Baccharus halimifolia*), wax myrtle, and cabbage palm hammocks. Man-made canals running parallel with Levee 74W are vegetated with herbaceous marsh plants such as pickerelweed (*Pontederia*), arrowhead (*Sagittaria*) and spikerush (*Eleocharis*). Hammocks of palm trees, oaks, saw palmettos and shrubs are scattered throughout the area. These hammocks provide shelter for mammals such as deer, fox and raccoon, and numerous reptiles.

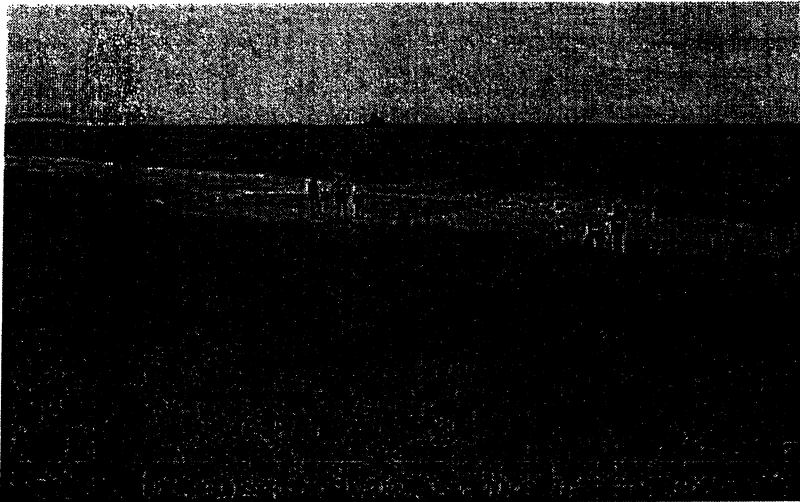


Photo 5: St. Johns Marsh Conservation Area

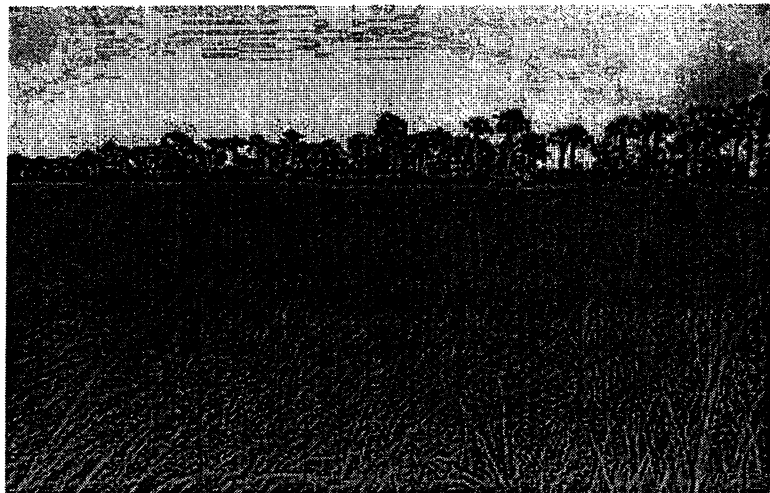


Photo 6: St. Johns Marsh Conservation Area

6.2.2 Fish and Wildlife Resources. Much of the information presented in this subsection was compiled by the SJRWMD, included in the Upper Saint Johns River Basin and Related Areas; Supplement 2, General Design Memorandum (GDM), Upper St. Johns River Basin Addendum III with Draft Environmental Impact Statement (DEIS).

6.2.2.1 Invertebrates. Two fresh water invertebrates found within the USJRB and within the project areas that are important prey items for wading birds, fish, and mammals, are crayfish (*Procambarus alleni*) and fresh water shrimp (*Palaemonetes paludosus*). Another very important invertebrate, the apple snail (*Pomacea paludosa*) is found throughout the wetlands. This species is the exclusive prey for the Federally endangered snail kite (*Rostrhamus sociabilis plumerus*).

Growing to approximately 2.8 inches, the apple snail is the largest freshwater snail in North America, occurring in warm waters of rivers, lakes, and ponds. Indigenous to Cuba and Florida, this species is capable of surviving periods of drought by burying itself in mud. The apple snail is reported to prefer broad stemmed plants for laying eggs and is abundant in sawgrass marshes. This snail has particular importance as a major prey species, not only for the snail kite, but also for the white ibis, (*Eudocimus albus*), the limpkin, (*Aramus guarauna*), and the boat-tailed grackle (*Casidix mexicanus*) (University of Mississippi, College of Marine Science website). Research conducted by Darby et. al. of the Florida Cooperative Fish & Wildlife Research Unit, 1997 indicated that the apple snail is found in sawgrass, prairie, slough and cattail habitats which occur in the C-1 Retention Area and the SLWMA. Snails were found in higher numbers in the prairie or cattail habitats, while eggs were laid in higher densities in densely vegetated areas such as sawgrass and cattail habitats. Wetland areas that undergo periodic dry downs exceeding 3 months in duration may depress apple snail populations, which in turn may contribute to snail kite population declines. Particularly, dry down periods should be timed to avoid the egg laying period, which occurs between March and July.

6.2.2.2 Fisheries Resources. Within the USJRB, there is a thriving freshwater sport fishery resource, which includes the largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxi nigromaculatus*) and bluegill (*Lepomis macrochirus*). Numerous forage fish such as the mosquitofish (*Gambusia affinis*), bluefin killifish (*Lucania goodei*), and least killifish (*Heterandria formosa*) are also abundant. The DEIS provides a complete list of fish that may be found in the basin. This resource provides an important recreational benefit as well as an important food base for wading birds, raptors, reptiles and amphibians, and mammals.

For the past three years the Florida Fish and Wildlife Conservation Commission (FFWCC) and the SJRWMD have been working on a proposal to restore Lakes SG & HB. Largemouth bass telemetry investigations conducted by the FFWCC have shown that lakes Washington, SG, and HB operate as a single fishery habitat. Although Lakes SG & HB have been degrading for years, fish from those areas have been able to escape to Lake Washington when water quality problems have temporarily deteriorated

following storm events. It is believed that bass recruitment to the smaller lakes is occurring from Lake Washington, since much of the spawning area in lakes SG & HB has been lost to organic sediment and dense hydrilla infestation. The two upper lakes have previously acted as catchment basins for flocculent organic materials arising from agricultural runoff and marsh detritus, thus preventing Lake Washington from rapidly filling with sediment. This preservation of Lake Washington habitat may be nearing an end. Recently collected sediment data indicate that lakes SG & HB are at or near their capacity to contain sediments, and downstream sedimentation rates assessed for Lake Washington are steadily increasing. The first fish kill ever reported in Lake Washington occurred in the spring of 1992 when a large quantity of organic sediment (hydrosol) and hydrilla moved downstream from the two small lakes into Lake Washington during very high water. The high oxygen demand (BOD) created by this event led to the death of about 13,000 fish along the eastern shore of the lake.

6.2.2.3 Reptiles and Amphibians. Common reptiles found within the project area include the American alligator (*Alligator mississippiensis*), cooter (*Chrysemys floridana*), Florida softshell turtle (*Trionyx ferox*), mud turtle (*Kinosternon bauri*), and snapping turtle (*Chelydra serpentina*). Within the drier habitats, several species of snakes are found such as the southern ringneck snake (*Diadophis punctatus*), southern black racer (*Coluber constrictor*), eastern diamondback rattlesnake (*Crotalus adamanteus*), pygmy rattlesnake (*Sistrurus barbouri*), and the eastern indigo snake (*Drymarchon corais*), a Federally threatened species. The wetter habitats support more aquatic species such as water snake (*Natrix sipedon*), Everglade's rat snake (*Elaphe obsoleta*), green water snake (*Natrix sipedon*), and cottonmouth (*Agkistrodon piscivorus*). The pig frog (*Rana grylio*) is one of the most important amphibians to occur within the project area for its recreational and commercial aspects. Other important frog species include the Florida cricket frog (*Acris gryllus*) and the southern leopard frog (*Rana sphenocephala*).

6.2.2.4 Avifauna. The DEIS, under Avifauna (Section 1.21.4), Table 5, lists migratory birds that could be found within the project area. We refer the reader to this table. This section will address only wading birds and waterfowl. Hoffman (1996) and Sewell (2001) published reports regarding wading bird use in the project area, and provide the most complete data sets. We refer the reader to Tables 7, 8 and 9 in the DEIS for complete survey results with reference to wading bird nesting and population estimates in the USJRB.

Wading bird species that have been identified in the USJRB include cattle egret (*Bulbulcus ibis*), great egret (*Casmerodius albus*), great blue heron (*Ardea herodias*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), glossy ibis (*Plegadis falcinellus*), white ibis (*Eudocimus albus*), and wood stork. Shallow waters within the project area are used predominantly by various wading birds, including the endangered wood stork (*Mycteria americana*), and waterfowl primarily for feeding, nesting, loafing and some roosting.

Hoffman (1996) and Sewell (2001) reported that from 1993, wading bird nesting increased in the upper basin. It also appears that the species composition is changing. Cattle egrets had once comprised a significant proportion (over 50 percent) of birds nesting in the marsh. However, this proportion has decreased since 1993. The proportion of wood storks nesting has increased since 1993.

Hoffman reported that a majority of the birds breeding in the USJRB are foraging elsewhere. More wood storks were observed feeding in agricultural lands that included drainage ditches rather than marshes. Cattle egrets, while nesting in large numbers in the marshes are feeding throughout the region. Research by Sewell was consistent with that of Hoffman in that greater numbers of wading birds were identified in the southern reaches of the USJRB than in the northern reaches.

The snail kite is federally endangered throughout its range primarily due to habitat destruction (U.S. Fish & Wildlife Service website). As noted above, the kite feeds almost exclusively on the apple snail, which requires sufficient water depths and vegetation for breeding and survival. The kite inhabits open freshwater marshes and is observed in sloughs and flats that are vegetated by sawgrass and spikerushes. The areas must retain a stable enough water table to support the apple snail population. Further, since snail kites forage by sight, areas covered with floating aquatic vegetation, such as water hyacinth, cannot be used. Further information regarding this species is offered in Section 9.5 of this report.

The osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis*), and the double-crested cormorant (*Phalacrocorax auritus*), feed predominantly on fish within the deeper open waters of the USJRB. The osprey, bald eagle and brown pelican all have keen eyesight allowing them to see fish beneath the surface of the water. Typically, they follow an “air to water” diving pattern for catching prey. The double-crested cormorant, in contrast, will actually dive underwater from the water surface using its feet for propulsion in order to catch prey. Each of these species and a variety of other wading birds discussed above use the USJRB for foraging habitat.

6.2.2.5 Waterfowl. The USJRB falls within the Upper Everglades U.S. Waterfowl Habitat Area of Concern. The FFWCC conducted annual waterfowl surveys within the USJRB between levee 74W and State Road 192 for three years (1997 through 1999). Eight waterfowl species were observed using the project area. The American coot was the most numerous species observed for two of the three years. The most diverse year was 1998 when the ringed-necked duck (*Aythya crecca*), American coot (*Fulica americana*) and blue- (*Anas collaris*) and green-winged teal (*Anas discors*) were the most numerous. Other species of waterfowl that were observed during the surveys were the ruddy duck (*Oxyura jamaicensis*), bufflehead (*Bucephala albeola*), mallard (*Anas platyrhynchos*), and hooded merganser (*Lophodytes cucullatus*).

6.2.2.6 Mammals. Several larger mammals such as deer, feral hogs, bobcat, and fox and many of the smaller fur-bearing mammals such as raccoon, opossum, muskrat, and weasel feed in the marsh and wet prairie habitats. According to

the Florida Natural Areas Inventory (2001), rare mammalian species found within the SJRWMD in Brevard County include Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), the Florida long-tailed weasel (*Mustela frenata peninsulae*), and the round-tailed muskrat (*Neofiber alleni*). Of these, the weasel and muskrat have the potential for being present throughout much of the project area. Further, non-rare, endemic species known to occur in wet prairie habitat include the rice rat (*Oryzomys palustris colorata* and *natator*) and the hispid cotton rat (*Sigmodon hispidus floridanus*). Otters also occur in the St. Johns River (Appendum 3- EIS).

7.0 THREATENED AND ENDANGERED SPECIES

The Service has evaluated the proposed Section 206 Lakes SG & HB Restoration Project in Brevard County for potential adverse impacts to federally listed species, or destruction or adverse modification of critical habitat.

Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	T
Carter's Mustard	<i>Warea carteri</i>	E
Crane, Whooping	<i>Grus americana</i>	E
Eagle, Bald	<i>Haliaeetus leucocephalus</i>	T
Kite, Snail	<i>Rosthrhamus sociabilis plumbeus</i>	E
Mouse, Southeastern Beach	<i>Peromyscus polionotus niveiventris</i>	T
Plover, Piping	<i>Charadrius melodus</i>	T
Scrub-jay, Florida	<i>Aphelocoma coerulescens</i>	T
Snake, Atlantic Salt Marsh	<i>Nerodia clarkii (=fasciata) taeniata</i>	T
Snake, Eastern Indigo	<i>Drymarchon corais couperi</i>	T
Stork, Wood	<i>Mycteria americana</i>	E
Turtle, Green Sea	<i>Chelonia mydas</i>	E
Turtle, Hawksbill Sea	<i>Eretmochelys imbricata</i>	E
Turtle, Leatherback Sea	<i>Dermochelys coriacea</i>	E
Turtle, Loggerhead Sea	<i>Caretta caretta</i>	T
Woodpecker, Red-cockaded	<i>Picoides borealis</i>	E

The above table lists the federally threatened and endangered plants and animals that occur or potentially occur in Brevard County. Of that group, the bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*), Audubon's crested caracara (*Polyborus plancus audubonii*), snail kite (*Rosthrhamus sociabilis plumbeus*), whooping crane (*Grus americana*), and Eastern indigo snake (*Drymarchon corais couperi*) may occur within the project area.

Unless otherwise noted, information in the following sections, 7.1 – 7.6, is referenced to the USFWS Draft Coordination Act Report for Proposed Modifications To Project Features North of the Fellsmere Grade, Central and Southern Florida Flood Control Project, Upper St. Johns River Basin and Related Areas, Brevard County, Florida.

7.1 BALD EAGLE. The bald eagle was down listed to threatened status in July 1995. No critical habitat has been designated for this species. In Florida, there are approximately 1,000 active bald eagle nesting territories

Bald eagles generally nest near large rivers, lakes or estuaries where they feed primarily on fish and water-dependent birds. Bald eagles are considered a water-dependent species. Nesting habitat includes the nest tree, usually a live pine (*Pinus* spp.) bald cypress (*Taxodium* spp.), and perch and roost sites. Eagles will, however, nest in dead trees, and recently have been observed nesting on towers. In Florida, most nests are found within five miles of water. In areas with a high human population, the distance between the nest site and water may be greater.

Eagles are monogamous. Eagles usually initiate nesting in the beginning of October. Incubation is about 30 days and the young fledge in about 90 days, usually by mid-May.

Eagles are opportunistic feeders. They will select live prey as well as feed on carrion. The primary diet is fish, but will take small to medium size mammals.

Because of the eagles improved population status and the availability of existing habitat under present conditions, neither maintaining the existing conditions nor constructing the proposed project is expected to provide measurable benefits or detriments to the eagle population in southern Brevard County.

7.2 AUDUBON'S CRESTED CARACARA. The Audubon's crested caracara was listed as threatened in July 1987. No critical habitat has been designated for this species. This species is a large, boldly patterned raptor, with a crest and unusually long legs. It is a Florida resident, diurnal, long-lived, and non-migratory.

Currently, the greatest concentration is within a five-county area north and west of Lake Okeechobee, including Glades, DeSoto, Highlands, Okeechobee, and Osceola. Birds are observed elsewhere, however. There is only one known active nest in Brevard County, at Viera.

This species occurs in dry or wet prairie areas with scattered cabbage palm (*Sabal palmetto*). It may also be found in lightly wooded areas. This species also uses improved or semi-improved pastures, again with scattered cabbage palm. The nest at Viera is in improved pasture, in a cluster of cabbage palms.

Little is known regarding breeding behavior. Egg laying begins in early December and the height of the nesting season is January and February. Nests are well concealed, and are found in tops of cabbage palms. Nests have also been found in live oaks (*Quercus virginiana*), Australian pine (*Casuarina* spp.), and black gum (*Nyssa biflora*). Clutch size is two or three eggs. Incubation lasts for about 28 days and is shared by both sexes. The young fledge in about eight weeks.

This species is highly opportunistic in their feeding habits, eating carrion and capturing live prey. Their diets include insects and other invertebrates, fish, snakes, turtles, birds

and mammals. They hunt on the wing, from perches and on the ground. They have been observed feeding on road kills in the company of vulture.

No significant change in the caracara population in the project vicinity is anticipated whether the project is constructed or not.

7.3 WOOD STORK. The wood stork was listed as endangered in February 1984. No critical habitat has been designated for this species. The wood stork is a large, long-legged wading bird. Wood storks currently breed in north and south Florida, parts of Georgia and coastal South Carolina. Wood storks have been documented nesting in the USJRB, in close proximity to the SJMCA. Aerial surveys conducted between 1993 and 1995 documented up to 1,300 wood storks and 296 nests in the USJRB (Hoffman 1996). Wood storks were observed foraging in a pasture near the project area. This species is primarily associated with freshwater habitats for nesting, roosting, foraging, and rearing young.

They typically construct their nests in medium to tall trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water. They tend to use the same colony sites over many years, as long as the sites remain undisturbed and sufficient feeding habitat remains in the surrounding wetlands.

Wood storks are seasonally monogamous, probably forming a new pair bond every season. Females lay a single clutch per breeding season, but will re-nest if the nest fails early in the breeding season. They lay about three to five eggs and incubation takes about 30 days

During the non-breeding season, wood storks are found throughout Florida, with interchange between north and south Florida and between states. This information suggests the notion of a single population in the southeast, which responds to changing environmental conditions through temporal relocation.

Foraging behavior requires that a large concentration of fish be present. Their feeding behavior is referred to as tactolocation or grope feeding. To forage, a wood stork wades through the water with its beak immersed and partially open. When it touches a prey item, the mandibles shut, raises its head, and swallows what it has caught. In order to increase feeding efficiency, it is critical that large numbers of fish, their primary prey item, are concentrated in shallow ponds or wetlands. This becomes even more critical during the breeding season when young must be fed. It is important to have sufficient feeding sites in close proximity to the rookeries to provide enough food items to the young in a timely manner to reduce the probability of nestling mortality due to starvation.

No significant change in the wood stork population in the project vicinity is anticipated whether the project is constructed or not. If the C-1 Rediversion project is constructed prior to this project then, maintaining the SLWMA as a wetland area will provide additional foraging habitat for the woodstork which is imperative during breeding season.

7.4 SNAIL KITE. The snail kite was listed as endangered in March 1967, followed by critical habitat designation in August 1977. However, the project area is not within critical habitat. The snail kite is a medium-sized raptor. The slender, decurved bill is an adaptation for extracting the kite's primary prey, the apple snail. The snail kite occurs in Florida, Cuba and Honduras. Within Florida, the current distribution is south and central Florida. Within the USJRB, snail kites are found primarily in the Blue Cypress Water Management Area, south of the Fellsmere Grade. Up to 100 birds and 60 nests have been documented. Snail kites have been observed in the SJMCA, presumably using the area for foraging purposes.

Snail kite habitat consists of freshwater marshes and shallow vegetated edges of lakes where apple snails can be found. Suitable foraging habitat is typically a combination of a low profile marsh with a mosaic distribution of shallow open water (about 1-foot to 4 feet deep), which is relatively clear and calm in order to visually search for apple snails. The marsh vegetation is dominated by spike rush, maidencane, sawgrass, and/or cattails. Dense growth of herbaceous or woody vegetation is not conducive for efficient foraging.

The snail kite usually nests in loose colonies. The clutch size ranges from one to four eggs. Incubation is between 23 to 30 days, and is shared by both. Hatching success averages about 2.3 chicks per nest. The most successful hatching period is from February through April. Breeding season varies depending on rainfall and water levels. The snail kite, when not breeding, uses communal roosts throughout the year in association with other birds, such as herons.

Without the project, no changes in the use of the project area by the snail kite are expected. If the proposed project is constructed, the snail kite may use the disposal area located within the SLWMA for foraging purposes.

7.5 EASTERN INDIGO SNAKE. The eastern indigo snake was listed as a threatened species in January 1978. No critical habitat has been designated for this species. The eastern indigo snake is a large, black, non-venomous snake. Throughout most of its range, this species is found in a variety of habitats from pine and scrubby flatwoods, high pine, dry prairie, edges of freshwater marshes, agricultural fields, coastal dunes and human altered habitats. This species requires a mosaic of habitats. This species requires sheltered "retreats" from winter cold and desiccating conditions such as gopher tortoise burrows, to provide protection. Throughout peninsular Florida, the eastern indigo snake may be found in all terrestrial habitats, which have not been subjected to increased human development. Eastern indigo snakes have been observed in drier habitats in the project area or along the levees in the Three Forks Marsh Conservation Area and the SJMCA.

This species is an active terrestrial and fossorial predator that will eat any vertebrate that it can consume. Adults prey on fish, frogs, toads, snakes, lizards, turtles, turtle eggs, birds and small mammals. Juvenile indigo snakes eat mostly invertebrates.

Eastern indigo snakes travel over a wide range into various habitats. In the summer months, home ranges for the adult male snakes (approximately 530 acres) are larger than adult females and juveniles (approximately 390 acres).

Without the project, no significant changes in the population of the eastern indigo snake in the project vicinity are anticipated. If the proposed project and the C-1 Rediversion project is constructed, use of the SLWMA will likely be lessened. As a terrestrial species, the eastern indigo snake will utilize the edges of the management area, but would not likely use the area when managed as a wetland. It will be forced to relocate to areas with drier conditions.

7.6 WHOOPING CRANE. The whooping crane was listed as a non-essential experimental population in Florida in January 1993. Measuring four to five feet tall, this is the tallest bird in North America. Whooping cranes are snowy white, with black wing tips, feet and beak. Their cheeks and crown are bright red. Juveniles are white with a mottled caramel head and neck. Adults attain a wingspan of up to seven feet.

Whooping cranes are monogamous and normally pair for life. Sexually mature between four and six years of age, the cranes usually lay two eggs, two days apart, in late April or early May. The incubation period is between 29 and 34 days, with fledging between 78 and 90 days. The life span of the whooping crane is 22 to 24 years.

Preferred habitat for nesting includes lake margins or among rushes and sedges in marshes and meadows where water is from eight to 18 inches deep. Emergent vegetation such as bulrushes and cattails provide protection from disturbance by humans and terrestrial predators.

Whooping cranes are omnivorous feeders taking crabs, clams, shrimp, snails, frogs, snakes, grasshoppers, larval and nymph forms of flies, beetles, water bugs, birds and small mammals. In addition, they eat over 58 species of fish. It is anticipated that the proposed project will provide additional foraging and nesting habitat for the whooping crane. If the project is not constructed, no changes in the population or distribution are expected.

8.0 RESTORATION BENEFITS AND RECOMMENDATIONS

The following table summarizes the environmental benefits/impacts that are expected to occur as a result of this project. These will be addressed further throughout this remainder of this document.

TABLE 1. Lakes Sawgrass & Hell N Blazes Summary of Benefits/Impacts

Alternative	Dredging Lake Hell N' Blazes	Dredging Lakes Hell N' Blazes and Sawgrass	No Action
Lake Hell N Blazes (260 acres)	+++ Fully restored	+++ Fully restored	-- Negative impact
Lake Sawgrass (463 acres)	No Benefit	+++ Fully restored	-- Negative impact
Lake Washington (4,362 acres)	+ Limited benefits	++ Good benefits to water quality and fishery	-- Negative impact
Disposal area (805 acres)	-- 805 acres impacted	-- 805 acres impacted	No impact

Notes:

- + limited benefit means that the environmental restoration benefits would be notably reduced.
- ++ good benefit means the length of time that benefits are recognized would be reduced.
- +++ fully restored means all objectives will be met – 1) fish habitat restored 2) habitat created for aquatic vegetation 3) water quality improved 4) exotic species minimized
- negative impact means existing environmental problems will continue and worsen with time.

8.1 Lakes Sawgrass and Hell'n Blazes. The goals of this project are to protect and restore valuable fish and wildlife habitat and resources, improve water quality conditions within Lakes SG & HB, minimize exotic species and create habitat for aquatic vegetation. The project will also benefit Lake Washington, thereby protecting the water supply of the City of Melbourne. To ensure that the goals of this restoration project are being met, a program to monitor both biological and hydrologic responses should be implemented. It is critical that the impacts of the project be closely monitored. Without such an effort it will be unclear whether project goals are being achieved. In addition, without monitoring, it is unlikely that problems will be recognized in sufficient time to correct them. Monitoring should include evaluation of water quality and hydrologic conditions, floristic and faunistic changes, and impacts on endangered species.

Lakes SG and HB are examples of problems associated with running canals directly into lakes, without the benefit of sheet flow across marsh. Severe sedimentation has occurred caused by fine organic deposits from agricultural runoff. It is anticipated that if the proposed C-1 Rediversion project is constructed, runoff from this portion of the watershed will be rerouted into the C-1 Retention Area into the SLWMA to recreate sheet flow to allow for sedimentation. If the C-1 Rediversion project functions as desired, these fine sediments would then settle out in the marsh within the C-1 Retention Area and the SLWMA, and reduce adverse impacts of heavy silt load deposits that eliminate lake bottom productivity. Although the main objective of the C-1 Rediversion Project is to reduce freshwater flows to the Indian River Lagoon, the rerouting of flows to the C-1 Retention Area will also provide benefits for this project. With this in mind it should be noted that most of the freshwater runoff that enters Lakes SG & HB is from Canal 40 to the east and the South Mormon Outside Canal to the west. The SJRWMD intends to acquire properties which can be used for stormwater retention areas to drain and treat

stormwater before it enters Lakes SG & HB. These are additional potential improvements, which, if pursued, will be addressed in separate document(s).

Benefits to these lakes include improved fish and wildlife habitat conditions, reduction of invasive plant species, and improved downstream water conveyance. This project will re-establish the aquatic habitat for the fisheries. These two lakes were once prime fishing areas that have, over time, become degraded. These two lakes are currently at their capacity to retain sediments and can no longer support the fisheries that are indigenous to the area. If left unattended, this degradation will continue into Lake Washington that serves as the water supply for the city of Melbourne.

Aquatic weeds are a major problem in Lakes SG & HB. Nuisance aquatic weeds may flourish in constructed areas such as water management areas, dredged disposal areas within water management areas, canals, and as a result of higher water levels in areas of restored wetlands. The management of the aquatic weeds will play a significant role in maintaining the fish and wildlife habitat as well as water quality for the future. If aquatic vegetation is not managed correctly, dissolved oxygen levels may be reduced resulting in fish kills. Control of aquatic weeds by certain herbicides may be incompatible with the use of the St. Johns River or Lake Washington as a drinking water supply. An effective exotic weed control program is essential to protect the water supply.

During the actual dredging of these two lakes, adverse impacts to submerged aquatic vegetation (not including nuisance species), shoreline vegetation and any "floating" islands should be avoided/minimized. Muck should be dredged primarily from beneath areas of open water. In addition, efforts should be made to minimize adverse impacts to the wetland areas that the dredge pipeline corridor will pass through.

8.2 Lake Washington. Without the restoration of Lakes SG and HB, it is expected that Lake Washington will continue to be impacted by increased sedimentation loads resulting in water quality degradation and reduced fishery habitat as water elevations decrease. Nuisance aquatic plant species infestation may expand or begin to reappear resulting in lower dissolved oxygen concentrations, adverse water quality impacts, and loss of fishery habitat. If dredged, the lakes can again act as water treatment and organic sediment (muck) retention areas for Lake Washington.

Muck removal from Lakes SG & HB, as a restoration effort, will greatly improve fisheries habitat in these lakes by exposing the firm peat or sand layer that will allow for re-colonization by desirable invertebrates and provide valuable habitat for fish. The restoration project should help control nuisance aquatic plant species encroachment and prevent accelerated sedimentation in Lake Washington. Increase in fish and invertebrate populations will also provide increased forage for wading birds and dabbling ducks. The effect of this removal is expected to have lasting benefits since many of the problems that caused the accelerated muck buildup will be corrected by the completion of the USJRBP.

8.3 Sawgrass Lakes Water Management Area. Purposes of the water management area are to provide stormwater storage and to improve the quality of

agricultural and urban surface discharges before they enter the marsh conservation area. If the hydrologic criteria are met, but the goals of the project which include protecting and restoring valuable fish and wildlife habitat and resources, improving water quality conditions within Lakes SG & HB, minimizing exotic species and creating habitat for aquatic vegetation are not met, the project (i.e. hydrologic criteria) may need to be re-evaluated and modified. Any proposed changes of this type should be reviewed by all the involved agencies.

One of the broad goals for the SLWMA is that the discharge from the wetland must meet the water quality criteria for the upper St. Johns River. This water quality criterion may be met with an effective treatment area of 486 hectares (1200 acres), flooded to a depth of 0.5 feet to 2 feet (Cera, et al., 2000). It is expected that internal improvements will be required to have SLWMA perform to the treatment expectations. For example, large existing canals within SLWMA may need to be filled or plugged in order prevent short-circuiting of the design flow. Wetland treatment performance could also improve with a good operation and management plan. Wherever possible the project design should allow water to pass through marshland. This practice will tend to keep remaining marshlands viable, allow marshes to take up nutrients and other contaminants, and temper flows so as to avoid extremes. Operation and maintenance activities on the weir (SW corner of disposal area) and cofferdam (in C-1 canal near junction with C-40 canal) will be required to maintain the integrity of the restoration project. Additionally, periodic exotic vegetation removal and vegetation mortality replacement are expected to occur (USACOE, 1999).

Timing for construction of the disposal area berms and subsequent disposal of material in the SLWMA is important. The SLWMA will become a constructed wetland designed to remove nutrients and suspended solids from Palm Bay runoff before it is discharged to the St. Johns River (part of the C-1 Rediversion Project). Disposing a large amount of dredged material (muck) on an established treatment wetland could have detrimental consequences including the elimination of established treatment wetland vegetation and alteration of flow patterns – and thus- treatment capabilities – of the constructed wetland. Additionally, control elevations for structures and levees of the established treatment wetland would have to be reevaluated due the potential change in topography. Disposal of the dredged material prior to the construction of the treatment wetland could prove very beneficial. Design of the treatment wetland could take advantage of the change in topography due to the dredged material deposition in low areas to increase the treatment areas within the SLWMA. One negative impact, which may occur as a result of disposing of the dredged material into the disposal area, is that the material may serve as a seed source in promoting the establishment of undesirable vegetation into an area, which will ultimately become a treatment wetland. This may create the opportunity for invasive species or other nuisance aquatic plants to spread into areas not previously infested.

In addition, disposal of the dredged material (muck) within the SLWMA will result in changes in the topography. The temporary containment berms (embankments/dikes) to be constructed would be 2 feet in height with a 1-foot (vertical) to 3 feet (horizontal)

slope and a crest 3 feet wide. The footprint of the constructed berms will cover approximately 5 acres within the SLWMA. At the present time, the berms are considered temporary and will be graded to improve flows within the SLWMA following the dredging project. However, if the containment berms remain in place permanently and the disposal material (muck) covers a significant amount of wetland area to a significant depth (inhibiting growth of wetland vegetation) then the permanent loss of existing wetlands may occur and will need to be addressed.

As noted previously, the southern half of the SLWMA (with the exception of the southeastern corner) is at a lower elevation resulting in vegetative cover that is comprised predominantly of wetland species such as sand cordgrass, soft rush, maidencane, and spikerush. The northern half of the management area is at a higher elevation and has been used as pastureland. High marsh plants such as the sand cordgrass and soft rush provide cover, forage habitat and/or nesting habitat for wading birds, songbirds and some small mammals such as those described in section 6.2.2.6 of this document. The sand cordgrass is generally found growing in moist locations but it adapts to dryer conditions well (Haehle et. al., 1999). Soft rush grows well in wet soil or around water bodies in three to five inches of water. Neither species is well adapted to growing in water that is 18 to 24 inches in depth. Subsequently, it is anticipated that the SLWMA will undergo a major change in dominant vegetation following completion of the proposed project. Although it is impossible to predict with any certainty the array of plant species that may colonize this area, it is anticipated that, emergent, free-floating, and submergent vegetation such as pickeralweed, arrowhead, water hyacinth, hydrilla and *Salvinia* may become the predominant vegetative cover as the area adapts to permanent inundation. Determination of predominant vegetation will be dependent on the nutrient content of the soils, seed sources that are present in the area or in the nearby vicinity, and the resulting hydroperiod/water depth.

A separate, but related issue concerns the soils of the SLWMA. The SJRWMD reported during review of the draft CAR for the C-1 Re-diversion Project that there is no evidence that the SLWMA was ever used for row crop farming, and therefore was not subject to pesticide application. As such, if future information indicates that row crop farming and associated pesticide applications have occurred, then these soils should be tested to determine levels of contaminants prior to use as a disposal area or for flood control. This data is needed to protect wildlife from pesticides and to determine if flooding of the SLWMA will result in unacceptable levels of contaminant releases to the SJMCA. It should be noted that alternating wet and dry periods can cause oxidation of the soils resulting in releases of nutrients. Maintaining this area as a wetland with a water cover will prevent nutrient releases from the sediments and potential impacts to the SJMCA.

Wading birds will continue to use the area for foraging. Wood storks have been observed in the vicinity of the SLWMA and associated canals. The area, once flooded will result in shallow maintained wetlands, providing a potentially significant increase in foraging habitat for the storks and for whooping cranes, which is a positive benefit for both species. However, nesting activity dependent on the existing vegetative cover will change. There has been no nesting of the caracara reported in the SJWMD. Since the

proposed project will result in the SLWMA becoming significantly wetter, it is unlikely that this species will begin utilizing the area.

The use of the area by small mammals and reptiles for forage and cover will change. The eastern indigo snake has been observed in the project area, and while flooding of the SLWMA will reduce the amount of available habitat in the immediate area, there remain many thousands of acres in the USJRB suitable for this species.

It is anticipated that as the vegetative species adapt in the SLWMA following flooding, the area may provide more suitable habitat for the apple snail, which in turn, may provide a significant source of food for the snail kite and some wading birds. The high nutrient content of the water will encourage the growth of vegetation. However, the type of growth that occurs, i.e. emergent, submergent, or floating, will determine how well the kite can utilize the area for foraging. Snail kites have not been documented using the SLWMA in the past; therefore, the snail kite distribution in the USJRB may increase or remain unchanged.

8.4 St. Johns Marsh Conservation Area.

Using the SLWMA for nutrient uptake will provide protection of the SJMCA from discharge of floodwater borne contaminants. This flow-through system will provide benefits through removal of excessive nutrients and subsequent improvement of water quality prior to release into the SJMCA. Therefore, providing the ability to regulate water levels in the SLWMA will benefit wetland functions and provide protection of the SJMCA ecosystem and the St. Johns River.

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APPENDIX B - SECTION 404(B) EVALUATION

SECTION 404(b) EVALUATION
ENVIRONMENTAL ASSESSMENT
LAKE HELL 'N BLAZES
BREVARD COUNTY, FLORIDA

I. Project Description

a. Location. The proposed work would be performed in the central portion of Brevard County. Lake Hell 'n Blazes is located approximately 1 mile east of the proposed disposal area which is located in the Sawgrass Lakes Water Management area.

b. General Description. The proposed plan calls for dredging the entire lake, and placing approximately 980,000 cubic yards of unconsolidated muck into the disposal site. The disposal site would be surrounded by a temporary berm. The western perimeter of the disposal site would be bounded by the existing berm along Canal 2.

c. Authority and Purpose. This project is authorized under Section 206 of the Water Resources Development Act (WRDA) of 1996 (PL 104-303) as amended. The project is an aquatic ecosystem restoration project that involves restoring quality fisheries habitat and improving and protecting water quality downstream in Lake Washington.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. The material to be removed is mainly a muck layer along with embedded hydrilla.

(2) Quantity of Material. Approximately 980,000 cubic yards of muck is planned for removal from the lake.

(3) Source of Material. The material to be placed in the disposal site is currently in Lake Hell 'n Blazes. It is there due to an accumulation of sediments over the last 50 or more years.

e. Description of the proposed Discharge Site.

(1) Location. The proposed discharge site is located in the SLWMA. Location can be seen in figure 2.

(2) Size. The size of the proposed disposal site is 383 acres.

(3) Type of Site. The disposal site would have 2 foot berms on north, south, and east boundaries, and a levee on the west side (C-2 Levee).

(4) Type of Habitat. The habitat consists of primarily wet prairie with some areas used intermittently as pasture.

(5) Timing and Duration of Discharge. Hydraulic discharge to disposal area, potentially around the clock until removal of muck is finished.

f. Description of Disposal Method. Hydraulic dredging would be used to remove 980,000 cubic yards of muck with even flow expected.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The area to be filled ranges in elevation from 15 to 17 feet NGVD 1927. Side slopes for the temporary berm would be 1 vertical to 3 horizontal.

(2) Sediment Type. The proposed temporary berm would be composed of granular material primarily made of sand, clayey sand, high plastic clays, and silty sand particles. The density of the sand layers ranged from very loose to medium. The consistency of the fine-grained soils ranged from very soft to very stiff.

(3) Dredge/Fill Material Movement. The fill material would be stabilized and should not be subject to erosion.

(4) Physical Effects on Benthos. No measurable impacts within the disposal areas since area impacted are wet prairies.

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water and Salinity Gradients (consider effects on: Salinity, Water Chemistry (pH, etc), Clarity, Color, Odor, Taste, Dissolved Gas Levels, Nutrients, Eutrophication, and others as appropriate) Should not be impacted since only freshwater areas would be involved.

(2) Current Patterns and Circulation Filling of drainage ditches should have minimal effect on current hydrologic patterns. Seepage water would flow south to a weir and back to the headwaters of the lake.

(3) Normal Water Level Fluctuations Should not be affected by the proposed project.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There may be a temporary increase in turbidity levels in the project disposal area during hydraulic discharging of the dredge much material. Turbidity would be short-term and localized.

(2) Effects on the Chemical and Physical Properties of the Water Column. There should be minimal temporary impacts to the chemical and physical properties of nearby water during the construction of the temporary berm. There are no acute or chronic chemical impacts anticipated as a result of construction. An environmental protection plan, prepared during detailed design, would address concerns regarding monitoring of equipment, maintenance and security of fuels, lubricants, etc.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the dredging area and construction area of the berm. These effects would be temporary.

(b) Dissolved Oxygen. Dissolved oxygen levels would not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be release by the project.

(d) Aesthetics. The aesthetic quality of the water in the immediate dredging area would experience some temporary turbidity due to the physical dredging process of removing the muck from the bottom of the lake. This would be a short-term and localized condition.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. Fill would displace approximately 5 acres of wetlands through construction of the temporary

construction berm and temporarily eliminate their primary productivity. Long term plans are to use this area as a water management area.

(b) Suspension/Filter Feeders. These organisms, should they exist in the wetlands to be filled, would be eliminated. An increase in turbidity could adversely impact burrowing invertebrate filter feeders within and adjacent to the immediate construction area. It is not expected that a short-term, temporary increase in turbidity would have any long-term negative impact on these organisms.

(c) Sight Feeders. These organisms, in the wetlands to be filled, would be eliminated. No significant impact on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

d. Contaminant Determinations. Material which would be dredged from the proposed borrow site would not introduce, relocate, or increase contaminants at the fill area.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. No effect.

(2) Effects on Benthos. No effect.

(3) Effects on the Aquatic Food Web. Adverse impacts on the food web should be temporary until the area becomes stabilized and recolonized.

(4) Effects on Special Aquatic Sites.

(a) Hardground and Coral Reef Communities. There are no hardground or coral reef communities located within the proposed project site.

(b) Sanctuaries and Refuges. No sanctuaries or refuges are within the proposed project area.

(c) Wetlands. In the worse case, the disposal area would result in the loss of up to 5 acres of wetlands. However, most likely (as proposed), upon completion of construction activities, the fill would be removed, the area would be rewetted and eventually re-vegetated with wetland species.

(6) Endangered and Threatened Species. No adverse impacts to endangered or threatened species are expected.

(7) Other Wildlife. No adverse impacts to small foraging mammals, reptiles, wading birds, or other wildlife are expected.

(8) Actions to Minimize Impacts. All practical safeguards would be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. Not applicable to this site.

(2) Determination of Compliance with Applicable Water Quality Standards. Would not be violated.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. Would not be impacted.

(b) Recreational and Commercial Fisheries. Dredging would result in benefits. Disposal should have no impact.

(c) Water Related Recreation. Dredging should result in benefits in the lake. Disposal should have no impact.

(d) Aesthetics. Dredging should result in benefits in the lake. Disposal should have no impact.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. No impacts.

(f) Determination of Cumulative Effects on the Aquatic Ecosystem. No adverse cumulative effects expected.

(g) Determination of Secondary Effects on the Aquatic Ecosystem. No secondary effects expected.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

c. After consideration of disposal site dilution and dispersion, the discharge of fill materials would not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. The Lake Hell 'n Blazes Ecosystem Restoration Project would not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

e. The placement of fill material would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife would not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values would not occur.

f. On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.

APPENDIX C - COASTAL ZONE MANAGEMENT CONSISTENCY

**FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES**

**ENVIRONMENTAL ASSESSMENT
LAKE HELL 'N BLAZES
BREVARD COUNTY, FLORIDA**

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: This chapter does not apply to the proposed project.

2. Chapters 163(part II), 186, and 187, County, Municipal, State and Regional Planning. These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the State's future. It's purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project has been and will continue to be coordinated with various Federal, State and local agencies during the planning process.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project does not interfere with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed project has been and will continue to be coordinated with the State.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: No land acquisition is necessary for the proposed project.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project area does not contain any state parks or aquatic preserves nor are there any within the immediate vicinity of the project that would be affected. The project is consistent with this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). The project will be consistent with the goals of this chapter.

8. Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed project would provide improved recreation for Lake Hell 'n Blazes. This would be compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

9. Chapters 334 and 339, Transportation. This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: No public transportation systems would be impacted by this project.

10. Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed project does not involve work in saltwater or involve saltwater resources. Therefore, this chapter does not apply.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The purpose of this project is to improve fish and wildlife resources under the jurisdiction of this agency, which is also the sponsor of the project.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: The SJRWMD is coordinating the use and consumption of State waters, as appropriate.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: The contract specifications would prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and would require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan would be required.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed project would not have any regional impact on resources in the area. Therefore, the project is consistent with the goals of this chapter.

16. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project would not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: This Environmental Assessment addressing project impacts has been prepared and will be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. The project complies with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project will be coordinated with the Department of Agriculture.

APPENDIX D – PERTINENT CORRESPONDENCE

Scoping Letter

Mailing List

Summary of Responses

Responses to scoping letter



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

DEC 26 2000

TO WHOM IT MAY CONCERN:

The U.S. Army Corps of Engineers, Jacksonville District, is beginning to gather information which will aid in identifying issues and concerns to be addressed in an Ecosystem Restoration Report with Environmental Assessment for Lakes Sawgrass and Hell 'n Blazes Restoration Project located in Brevard County, Florida (see enclosure 1).

The scope of this feasibility study is to evaluate the effects of the Lakes Sawgrass and Hell 'n Blazes restoration project. See enclosure 2 for project information. Environmental considerations will include the effects of the proposed action on wetlands, aesthetics, water quality, fish and wildlife habitats and values, endangered or threatened species, and historical or archeological resources.

We welcome your views, comments and information about resources, study objectives and important features within the study area, as well as any suggested improvements. If you know of anyone else who may wish to comment, please notify them of this opportunity. Letters of comments or inquiry should be addressed to the letterhead address to the attention of the Planning Division, Environmental Studies Section and should be received by this office within 30 days of the date of this letter.

Sincerely,

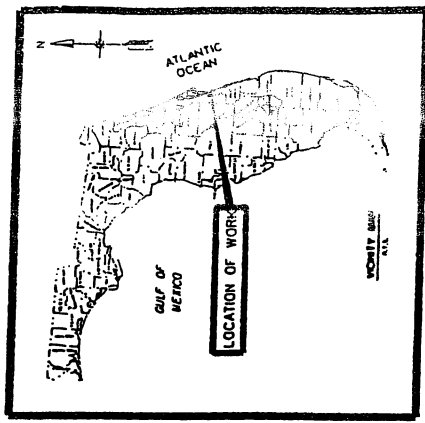
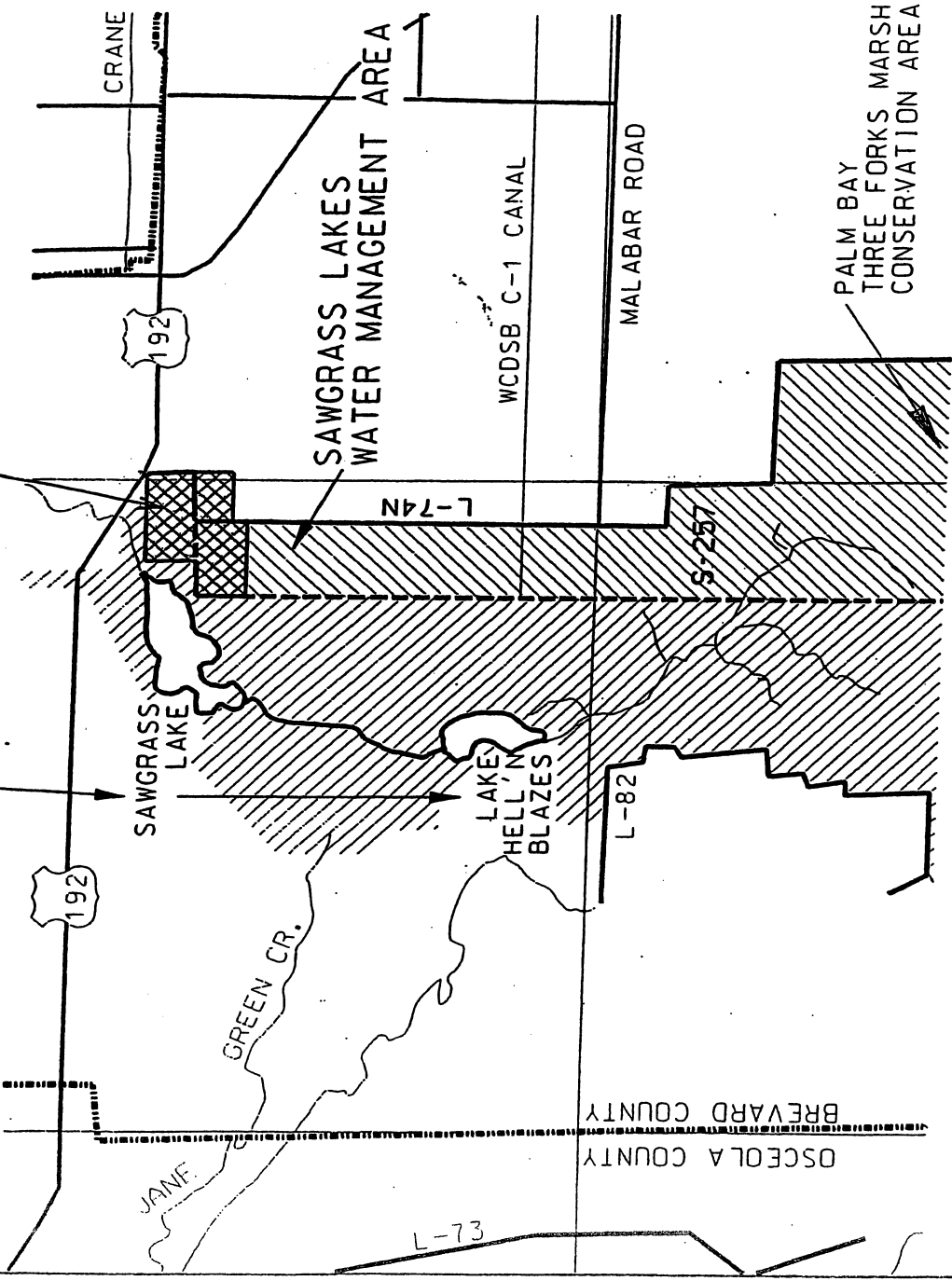
James C. Duck
Chief, Planning Division

Enclosures

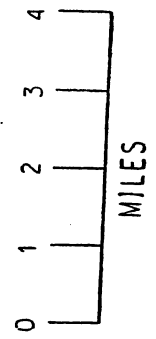
U.S. Army	
REVISION	DATE
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PROPOSED DREDGING LOCATIONS

850 ACRE DISPOSAL SITE



U.S. Army ENGINEER DISTRICT JACKSONVILLE	
CORPS OF ENGINEERS	
SECTION 200 PRELIMINARY REVISION P. 100	
LAKES SAWGRASS AND HELL 'N' BLAZES	
BREVARD COUNTY, FLORIDA	
VICINITY LOCATION MAP	
DATE	100 IN 100
SCALE	100 IN 100
DATE	100 IN 100



MILES

Lakes Sawgrass and Hell 'n Blazes Restoration Project

The proposed plan involves restoration of Lake Sawgrass and Lake Hell 'n Blazes. These two lakes located within the upper St. Johns River basin have been adversely impacted by high sedimentation, destruction of fish and wildlife habitat, and degraded water quality conditions, which have been declining since the 1960's.

The restoration is recommended by the Florida Fish and Wildlife Conservation Commission (FWC) and the St. Johns River Water Management District (SJRWMD). The plan includes removal of approximately 2.0 million cubic yards of unconsolidated muck from the bottom of the two lakes using a hydraulic dredge. This dredged material would be placed in an 850-acre site (shown in Enclosure 1) which is adjacent to the Sawgrass Lake Water Management Area (SLWMA).

These lakes are located in the 2,000 square mile flood control project (Upper St. Johns River Basin Project) constructed in partnership by the U.S. Army Corps of Engineers and the St. Johns River Water Management District (SJRWMD).

US DPT OF INTERIOR, ATTN:
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OFFICE OF ENV POLICY &
COMPLIANCE

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12cpys draft, 6cpys FEIS, 1cpyEA

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Northeast Palm Bay, Florida
32905

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Melbourne, FL 32901

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Cocoa Bassmasters of Central FL
P.O. Box 212
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Mr. Stephen Peffer
Asst. County Manager
Brevard County Govt Center
2725 Judge Jamieson Way
Melbourne, FL 32940

SUMMARY OF RESPONSES TO DECEMBER 20, 2000 SCOPING LETTER

**R.C. Dix, Sr.
P.O. Box 2634
Melbourne, FL 32902**

December 28, 2000

1. States that he opposes proposed project – No response necessary
2. Wants to know who will be paying for project and what the cost will be.
Response: Total project cost is shared with the Federal sponsor paying 65% and the local sponsor paying 35%. The federal share of a section 206 project cannot exceed 5 million dollars. Cost estimates are presented in the main report.
3. Questions how disposal site was selected and what will be the effects to wildlife and endangered species on this site.
Response: These questions are addressed in the main report, in sections 3 and 4 of the EA, and Appendix A, which contains the U.S. Fish and Wildlife Service's Fish and Wildlife Coordination Act Report.
4. States a request for project information including maps of disposal site, bid requirements and construction plans, and mailing list of agencies informed of this action.
Response: This information is presented in the Draft EA and the Ecosystem Restoration Report, which will be made available to the public by a notice of availability.

**Save the St Johns River, Inc.
4045 Edgewood Place
Cocoa, FL 32926**

December 29, 2000

Supports the proposed action – No response necessary

**Al Henderson
7105 Crabgrass Rd
St. Cloud, FL 34773**

January 5, 2001

1. Requests better description of disposal site.
Response: Addressed in the main report.
2. Supports action – No response necessary.

**Omar Marren, Eskimo Panels, Inc
2360 W 76th St
Hialeah, FL 33016**

January 9, 2001

Supports proposed action – No response necessary

Richard McCormick
752 Neuse Avenue
Orlando, FL 32804

January 10, 2001

1. Supports proposed action – No response necessary
2. Questions if there are plans to plant aquatic vegetation after dredging.
Response: There are no plans for re-vegetation. Natural recruitment of native plant species is expected.

Kevin Hall
P.O. Box 953
DeLeon Springs, FL 32130

January 10, 2001

Supports proposed action – No response necessary

Paul Krause, trustee
9225 Collins Avenue
Miami Beach, FL 33154

January 12, 2001

Requests more information – Name is on mailing list for NOA

Vernon Gleason
5420 Friendly St
Cocoa, FL 32927

January 16, 2001

Supports the proposed action – No response necessary

National Marine Fisheries Service
No comments on project (e-mail)

Feb 5, 2001

Florida Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399

February 9, 2001

1. Requests that NEPA document present alternate sites for disposal.
Response: See the main report and section 2 of EA.
2. Requests that navigable areas are not adversely impacted.
Response: This is addressed in section 3 of EA.

Cocoa Bassmasters of Central Florida
P.O. Box 212
Sharpes, FL 32959

March 18, 2001

Supports proposed action – No response necessary

R. C. DIX, Sr.

Post Office Box 2634

Melbourne, FL 32902-2634

321-768-2676

Department of the Army
Jacksonville District Corps Of Engineers
P.O. Box 4870
Jacksonville, Florida 32232-0019

Atten: Mr. James C. Duck
Chief, Planning Division

RE: Lakes Sawgrass & Hell-n-Blazes Restoration Project.

December 28, 2000

Dear Mr. Duck:

First let me say that I am opposed to this dredging of these two bodies of water. **FIRST**, this is only a band aid temporary fix. **Second**, as long as the water control structure located at the NW corner of Lake Washington is in place there will never be any effective bottom flow on the river from the dam south. Accordingly the two lakes in question here over time will simply re-fill again with your so called "unconsolidated muck".

Then there is the cost of this project, who's paying this? Then the spoil site, which is poorly defined in your map, how long will this area be a "dead zone" with nothing living in it. What happens to the existing 850 ac eco-system, the wildlife that abounds there. Then there is what SJRWMD paid to get this 850 ac. of ground that was sold to the "public" that it was going to be used for public use such as hunting, fishing hiking & etc.

Accordingly, and pursuant to the applicable Rule I am requesting the following information be sent to me so that I can properly evaluate what you and SJRWMD and the FWC are proposing here.

1. An exact map showing the meets and bounds of this proposed 850 ac disposal site.
2. What is the cost to the taxpayers both State & Federal.
3. What justification is SJRWMD using for destroying this 850 acres.
4. A copy of the bid requirements and the construction plans.
5. What steps are being taken to prevent the death of local wildlife that currently inhabit this 850 acre site.
6. A list identifying all the wildlife that the FWC, SJRWMD and your office have documented as area wildlife and disclose the use and existence of all known "endangered species" that are known to or might frequent the 850 acre site.

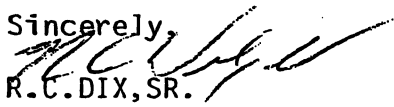
7. A list of all the " environmental groups " that have been or will be notified of this project by the SJRWMD , FWC and your office.

After I have a chance to review the information , I will be able to direct my comments and further inquires to the proper agencies. I must, in all honesty inform you that I am going to fight this project in any lawful forum.

I personally think that SJRWMD has done a tremendous job up until now on their efforts to improve and restore the river basin and provide more habitat and public use but this project appears to fall short of the mandate that the SJRWMD has by Statue and this certainly is not within their land-use doctrine.

Thank you for your time and attention in this matter. I am looking forward to reviewing the requested information.

Sincerely,


R.C.DIX, SR.

RCDSR/dr
cc/file



SAVE the St. Johns River, Inc.
4045 Edgewood Place
Cocoa, Florida 32926



29 December 2000

Corps of Engineers, Jacksonville District
Planning Division, Environmental Branch
P. O. Box 4970
Jacksonville, Florida 32232-0019
Attn: Chief, Planning Division (James C. Duck)

Dear Mr. Duck

Thank you for notifying me of the COE comment period on the long overdue restoration of Lakes Hell N' Blazes and Sawgrass in the Upper Basin of the St. Johns River.

In 1985, I called a public meeting to create an organization to work with government officials in restoring the St. Johns River. I was elected President of the newly formed group – we named ourselves "S.A.V.E. the St. Johns River". We became very involved in numerous issues throughout the entire length of the majestic river.

In 1988, I wrote a letter to the St. Johns River Water Management District requesting a feasibility study of these lakes to determine "not if restoration was needed, but how to accomplish it". Our membership of 23 organizations is comprised of approximately 3,000 local Brevard County supporters. We strongly recommend the COE proceed without further delay to restore these once thriving lakes with their abundant wildlife and fishery.

I was instrumental in getting the Upper Basin included in the "American Heritage Rivers Initiative". I convinced U.S. Representative Dave Weldon to reinstate District 15 into this "grant oriented" initiative. I received a personal invitation to participate in the national media event in North Carolina where President Clinton named the 14 rivers from a submitted list of 126 rivers nationwide. I was requested by Mayor Jack Delaney, Jacksonville to serve on the Steering Committee for the entire St. Johns River.

I have been a member of the SJRWMD Recreational Advisory Committee for 10 years. I have served on the Board of Directors for the Florida Wildlife Federation, stepping down last year to devote more of my time to restoring the St. Johns River.

I provided the above to have you understand our group's dedication to this and other projects involving the St. Johns River. I am very familiar with the area of restoration proposed and find no issue, environmental or otherwise, that concerns me or my organization.


SAVE - Sportsmen Against Violating the Environment

I am convinced our County Commission strongly supports this restoration effort. Commissioner Sue Carlson, whose district encompasses the majority of the river in Brevard County is a strong supporter and serves as Chair of the Commission. She serves as Co-Chair of the Upper Basin Advisory Committee and is a member of the Steering Committee for the American Heritage River Initiative. We will be applying for federal and state grants for additional public access, water quality improvements via removal of sediment from other areas of the St Johns River (portions of Lake Poinsett and Lake Winder), etc.

I understand the funding is in place, and Please keep me advised of the progress, or any public meetings to be held. I would be especially grateful to the COE for any schedules or dates for this activity so I can inform our membership.

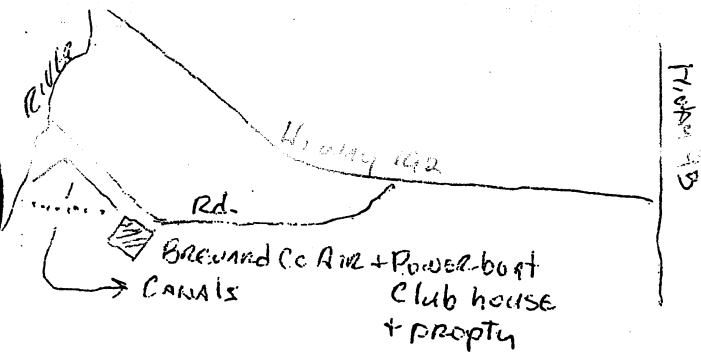
My e-mail address is: ROYJAY@BELLSouth.NET My phone number: 321-632-8403

Respectfully



Leroy Wright, President
SAVE the St. Johns River, Inc.

cc: Comm. Carlson, Dist IV



Melb. Fl. 1/5/01

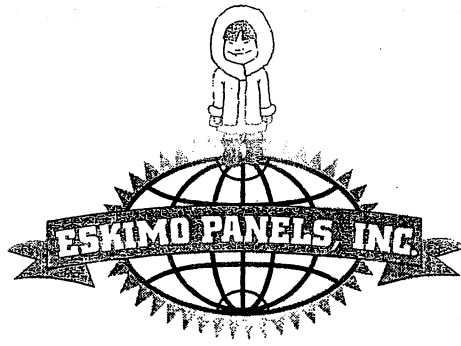
Mr. Duck.

IN RESPONSE to your request for input
ON LK. SAWGRASS & HELEN DREGGING & RESTORATION
THE BREVARD COUNTY AIR + POWER BOAT ASSC. own
property at the intersection of 192 (Hiway) & SWEETWATER
CANAL with club house & boat ramp.
from map with info letter this concerns the
members as to the 850 acre disposal site
Could you describe this area to us in a better
form.

All of our Air boating at the St John's ARE
ON THE EAST side (territs) we are thankful
of this restoration effort & will support you
in ANY way
we (club) feels the west side of RIVER is
the best area for disposal as its unused for
REC. in ANY way

P.S.
I'll help in ANY way
BEING A USER OF THE RIVER
& MARSH FOR 40 YEARS.
"Call me"

Thank you
Al Henderson
7105 CRABGRASS RD.
St Cloud, Fl. 34773
407-892-7021



Planning Division
Environmental Branch
Dept of the Army
Jacksonville District Corps of Engineers

P.O. Box 4970

Jacksonville FL 32232-0019.

Re: Support of Lake Hellw. Blazes Restoration Project.

Dear Sirs,

Recently I learned about your proposal to restore the Habitat of Lake Hellw. Blazes & Lake Sawgrass. I commend your Division and thank you for undertaking such an important project. As an avid waterfowler and sportsman I know our South Florida area will gain a greater diversity and quantity of waterfowl, fish, and game. This will ensure our hunting traditions, and more importantly ensure the viability of this habitat for the future.

Thank You
Omar M. Fisher
Hwy. 1, Florida
and
Kissimmee

Manufacturers of Walk-In Coolers & Freezers

2360 West 76th Street, Hialeah, FL 33016

Phone: 305-556-1106 • Fax: 305-825-5736 • 1-888-923-3835

January, 10, 2001

Planning Division
Environmental Branch
Department of the Army
Jacksonville District Corps of Engineers
PO Box 4970
Jacksonville, Florida 32232-0019

Attention: Mr. James C. Duck
Chief, Planning Division

Regarding: Lakes Sawgrass and Hell'n Blazes Restoration Project

Dear Mr. Duck:

Please provide me with information regarding the protection and/or enhancement of the waterfowl habitat on Lakes Sawgrass and Hell'n Blazes during/after the dredging project. I would also like a person whom I may contact regarding the above-mentioned project and the times/dates/locations of any and all public meetings regarding the above-mentioned project.

I have recently heard about the December 20, 2000, U.S. Army Corps of Engineers, Jacksonville District letter regarding the Lakes Sawgrass and Hell'n Blazes restoration/dredging project. I have also researched the project via the internet. The Freshwater Fisheries web page and Gorp.com have mention of the dredging project as well.

In addition to fishing, I am a waterfowl hunter and have a definite interest in the waterfowl management aspects of this project. Lakes Sawgrass and Hell'n Blazes are and have historically been utilized for waterfowl hunting. The proposed dredging is bound to impact the ecosystem and will hopefully protect the downstream Lake Washington from sedimentation. There are many positive aspects of dredging and lake draw-down projects that benefit both fish and waterfowl habitat.

Both waterfowl and fish also benefit from aquatic vegetation. Are there any plans to plant aquatic vegetation once the dredging project has been completed?

Thank you for your time.

Respectfully,



Richard McCormick
752 Neuse Avenue
Orlando, Florida 32804

January, 10, 2001

Planning Division
Environmental Branch
Department of the Army
Jacksonville District Corps of Engineers
PO Box 4970
Jacksonville, Florida 32232

Attention: Mr. James C. Duck
Chief, Planning Division

Regarding: Lakes Sawgrass and Hell'n Blazes Restoration Project

Dear Mr. Duck:

I have recently heard about the December 20, 2000, U.S. Army Corps of Engineers, Jacksonville District letter regarding the Lakes Sawgrass and Hell'n Blazes restoration/dredging project. I have also researched the project via the internet. The Freshwater Fisheries web page and Gorp.com have mention of the dredging project as well.

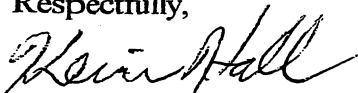
Please provide me with information regarding the protection and/or enhancement of the waterfowl habitat on Lakes Sawgrass and Hell'n Blazes. I would also like to know whom I may contact regarding the above-mentioned project and the times/dates/locations of any and all public meetings regarding the above-mentioned project.

I am a waterfowl hunter and have a definite interest in the waterfowl management aspects of this project. In addition to fishing, Lakes Sawgrass and Hell'n Blazes are also utilized for waterfowl hunting. The proposed dredging is bound to impact the ecosystem and will hopefully protect the downstream Lake Washington from sedimentation. To me, the obvious problem is *overzealous* hyacinth spray crews. I have personally witnessed crews that would spray everything in sight. This dead plant matter falls to the bottom, decays - which robs the water of dissolved oxygen, and contributes greatly to the amount of muck on the lake bottom. This accumulation of muck impairs the ability of fish to reproduce.

There are many positive aspects of dredging and lake draw-down projects that benefit both fish and waterfowl habitat. Both waterfowl and fish also benefit from aquatic vegetation. The fish thrive in the aquatic vegetation (nursery areas). The waterfowl feed on various types of aquatic vegetation, including hydrilla, coontail, and dollar pads. The marshes also need to be rehabilitated. They could use a good drying out, burning, and then possibly replanting with native vegetation.

Thank you for your time.

Respectfully,



Kevin Hall

P. O. 1 x 953

DeLeon Springs, FL 32130

904-985-4538

Paul Krause

9225 Collins Avenue

Miami Beach, Florida 33154

Fri, Jan 12, 2001

U.S. Army Corps of Engineers
Planning Division,
Environmental Branch
P.O. Box 4970
Jacksonville, FL 32232-0019
ATTN: Ms. Liz Manners

Dear Ms. Manners:

We are land owners in the vicinity of the proposed dredging of Lakes
Sawgrass and Hell n' Blazes.

It would be appreciated if we could learn more about the plan encompassing
this project.

Any information that would be available to us may be forwarded to the
letterhead address or by phone collect to the undersigned at 305-865 4104.

Kindly indicate whatever charges would attach to this request.

Cordially,

Paul Krause, Trustee

A handwritten signature in cursive script that reads "Paul Krause". The signature is written in dark ink and is positioned below the typed name "Paul Krause, Trustee".

5420 Friendly ST.
CoCoA, FL. 32927

JAN. 16, 2001

Jacksonville District Corps of Engineers
Planning Division
Environmental Branch

To Whom It May Concern

I was very pleased to receive your ^{letter} concerning the feasibility study to evaluate the effects of the Lakes Congress and Hell in Blazes restoration project. I have been a member of SAVE since its inception and ^{am} very much aware of the need of this project. I have supported the FWC from the beginning in the pursuit of their goal to clean up this area. Waver Cox has worked very hard to have these areas cleaned up.

If I can be of any help in this area, please advise.

P.S. Change of Address
Vernon L Gleason (LARRY)
5420 FRIENDLY ST
CoCoA, FL 32927

Sincerely
Vernon L Gleason
Vice-President of SAVE

Lizabeth R Manners

02/05/2001 12:26 PM

To: David Dale <David.Dale@noaa.gov> @SMTP@Exchange
cc: Catherine L Byrd/CESAJ/SAJ02@CESAJ
Subject: Re: Lakes Sawgrass & Hell'n Blazes Restoration 

Thank you for the information!

From: David Dale <David.Dale@noaa.gov> on 02/02/2001 04:04 PM

From: David Dale <David.Dale@noaa.gov> on 02/02/2001 04:04 PM
To: Lizabeth R Manners/CESAJ/SAJ02@CESAJ, "Cheney Donna (NOAA)" <Donna.Cheney@Noaa.Gov> @SMTP@Exchange, "Rolfes Sharon (NOAA)" <Sharon.Rolfes@noaa.gov> @SMTP@Exchange
cc:
Subject: Lakes Sawgrass & Hell'n Blazes Restoration

The National Marine Fisheries Service (NMFS) has reviewed the information provided with your letter, dated December 20, 2000, regarding the subject project. Based on the information provided, we have determined that the resources affected are not ones for which the NMFS is responsible and, therefore, we do not have any comments to provide regarding this project.

We appreciate the opportunity to provide you with our comments. Please direct related comments, questions, or correspondence to Mr. David N. Dale in St. Petersburg, Florida. He may be contacted at 727/570-5311 or at the letterhead address above.



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

"Dedicated to making Florida a better place to call home"

JEB BUSH
Governor

STEVEN M. SEIBERT
Secretary

February 9, 2001

Mr. James Duck
Department of the Army
Jacksonville District Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

RE: Department of the Army - District Corps of Engineers - Scoping Notice -
Ecosystem Restoration Report with Environmental Assessment - Feasibility Study
to Evaluate Effects of Lakes Sawgrass and Hell ' N Blazes Restoration Project -
Brevard County, Florida
SAI: FL200012270810C

Dear Mr. Duck:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) offers a number of comments and recommends that the report include information concerning impacts on waterbodies located downstream from the project, as well as regarding impacts on area wetlands. The report should present alternate sites for disposal, including any that are located in upland areas, and information should be presented showing avoidance and minimization of wetland impacts. The Florida Natural Areas Inventory has found several Element Occurrences mapped within the proposed area. It is recommended that a site-specific survey be conducted to determine the current presence or absence of rare, threatened, or endangered species. A summary of the elements recorded for Brevard County is enclosed for your convenience. The project will require an Environmental Resource Permit from DEP's Central District Office in Orlando. Final consistency will be determined during the permitting stage of this project. Please refer to the enclosed DEP comments.

The Florida Fish and Wildlife Conservation Commission (FWC) notes that it is the local sponsor for this project and it strongly supports the ecosystem restoration project. The project

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100

CRITICAL STATE CONCERN FIELD OFFICE
2796 Overseas Highway, Suite 212
Marathon, FL 33050-2227
(888) 333-3400

COMMUNITY PLANNING
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 498-2222

EMERGENCY MANAGEMENT
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 498-2222

HOUSING & COMMUNITY DEVELOPMENT
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(904) 498-2222

Mr. James Duck
February 9, 2001
Page Two


will benefit the fisheries resources and environmental health of the referenced lakes, as well as the upper St. Johns River, including Lake Washington, which is the water supply for the City of Melbourne. Please refer to the enclosed FWC comments.

The St. Johns River Water Management District (SJRWMD) has worked closely with the U.S. Army Corps of Engineers and the FWC on this project and strongly supports it. The SJRWMD notes that the proposed project will require an Environmental Resource Permit from DEP. Detailed information and plans for protecting surface waters and wetlands within the project lakes, the spoil sites, and downstream to Lake Washington should be included in the permit application. Other considerations include ensuring that existing navigable areas are not adversely impacted and that any listed wildlife species in the area are identified and specific information provided showing that these will not be adversely impacted. Overall, the project is expected to be environmentally beneficial. The specific positive impacts should be described relative to each of the environmental criteria sites in DEP and SJRWMD rules. For more detailed information concerning permitting, the applicant should contact the SJRWMD's Palm Bay Service Center, and for information on the restoration program, the applicant should contact the SJRWMD's Palatka Headquarters. Please refer to the enclosed SJRWMD comments.

Based on the information contained in the scoping notice and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced project is consistent with the Florida Coastal Management Program. A final determination will be made during the state's permit review. All comments received to date from our reviewing agencies are enclosed for your review.

Thank you for the opportunity to review this project. If you have any questions regarding this letter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 414-5495.

Sincerely,


Joseph F. Myers, Acting Executive Director
Florida Coastal Management Program

JFM/cc

Enclosures

cc: Marlane Castellanos, Department of Environmental Protection
Bradley Hartman, Fish and Wildlife Conservation Commission
B. Kraig McLane, St. Johns River Water Management District

JAN-30-2001 11:55
COUNTY: Brevard

FL DEPT AGRIC & CONS

850 488 0863 P.06

DATE: 12/27/2000

COMMENTS DUE DATE: 01/26/2001

CLEARANCE DUE DATE: 02/09/2001

Message:

SAI#: FL200012270

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

X Agriculture
Community Affairs
Environmental Protection
Fish & Wildlife Conserv. Comm
State
Transportation

St. Johns River WMD

Environmental Policy/C & ED

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of the Army - District Corps of Engineers - Scoping Notice - Ecosystem Restoration Report with Environmental Assessment - Feasibility Study to Evaluate Effects of Lakes Sawgrass and Hell 'N Blazes Restoration Project - Brevard County, Florida.

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 922-5438 (SC 292-5438)
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- ☒ No Comment
☐ Comments Attached
☐ Not Applicable

- ☒ No Comment/Consistent
☐ Consistent/Comments Attached
☐ Inconsistent/Comments Attached
☐ Not Applicable

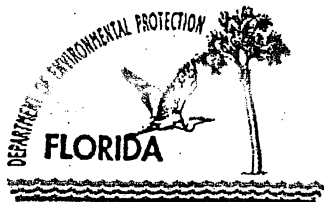
Jack P. Dodd, Planner
Division of Forestry
Forest Resource Planning &
Support Services Bureau
3125 Conner Blvd. Mail Stop C23
Tallahassee, FL 32399-1650

From:
Division/Bureau:

Date:

01-26-01

TOTAL P.06



Jeb Bush
Governor

Department of Environmental Protection

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

January 17, 2000

RECEIVED
JAN 23 2001
David B. Secret

Cherie Trainor
State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

State of Florida Clearinghouse

RE: US COE/Scoping Notice for Ecosystem Restoration Report with Environmental Assessment for Feasibility Study, Lakes Sawgrass and Hell 'N Blazes, Brevard County

SAI: FL00-0810C

Dear Ms. Trainor:

The Florida Department of Environmental Protection (FDEP) has completed its review of the above-referenced project and we offer the following comments:

This Ecosystem Restoration Report evaluates the environmental effects of the restoration of the two above-mentioned lakes, which are located in the Upper St. Johns River basin. Historically these lakes have been impacted by high sedimentation, causing destruction of fish and wildlife habitat, and degraded water quality conditions. The decline began in the 1960s and continues today, resulting in this project's recommendation by the Fish and Wildlife Conservation Commission and the St. Johns River Water Management District.

It is recommended that the Report include information concerning impacts on waterbodies located downstream from the project, as well as effects on area wetlands. The map shows the 850-acre disposal site is located in an area that is predominantly a wetland. This Report should present alternate sites for disposal, including any that are located in upland areas. Information should be presented that would show avoidance and minimization of wetland impacts.

The Florida Natural Areas Inventory (FNAI) has notified this Department that it has found several Element Occurrences mapped within the proposed area. For this reason, it is recommended that a site-specific survey be conducted to determine the current presence or absence of rare, threatened, or endangered species. Once this survey is completed, a plan should be developed to protect these listed species. Only individuals familiar with Florida's flora and fauna should conduct surveys. For your convenience, a summary of the elements recorded for the County is enclosed. Because the data from FNAI is not always based on comprehensive or site-specific field surveys, it should not be regarded as a final statement on the biological resource of the site being considered, nor should it be substituted for on-site surveys.

Ms. Cherie Trainor

January 17, 2001

Page Two

The project, as described in the materials, would require an Environmental Resource Permit (ERP) from the Department's Central District Office in Orlando. Final consistency will be determined during the permitting stage of this project.

Thank you for the opportunity to comment on this project. If I can be of further assistance, please contact me at (850) 487-2231.

Sincerely,



Marlane Castellanos

Office of Intergovernmental Programs

MC/
Enclosure

FLORIDA NATURAL AREAS INVENTORY

1018 Thomasville Road, Suite 200-C · Tallahassee, Florida 32303 · (850) 224-8207 · FAX (850) 681-9364 · www.f

January 9, 2001

Marlane Castellanos
Department of Environmental Protection
Office of Legislative and Governmental Affairs
3900 Commonwealth Blvd., MS 47
Tallahassee, FL 32399

RECEIVED

JAN 10 2001

OIP/OLGA

RE: SAI# FL00-0810C

Dear Ms. Castellanos:

Thank you for your request for information from the Florida Natural Areas Inventory (FNAI). Your data request, received on January 3, 2001, specified an area located in Township 28S, Range 35E, Section 1 and 11, in Brevard County.

A search of our maps and database indicates that currently we have several Element Occurrence Records mapped within one mile of the study area (see enclosed map and table). The map legend indicates the precision of the element occurrence location, defined as second (within about 300 feet), minute (within about one mile), or general (within about 5 miles). Also note the locations of breeding colony sites identified by the Florida Game and Fresh Water Fish Commission Breeding Bird Atlas Project.

The Inventory always recommends that a site specific survey be conducted to determine the current presence or absence of rare, threatened, or endangered species. Surveys should be conducted by individuals familiar with Florida's flora and fauna. For your convenience, a summary of the elements recorded for Brevard County is enclosed.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Marlane Castellanos

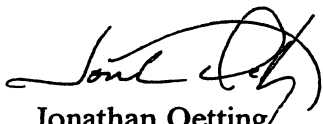
January 9, 2001

Page 2

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. FNAI data may not be resold for profit.

Thank you for your use of FNAI services. If I can be of further assistance, please give me a call at (850) 224-8207.

Sincerely,

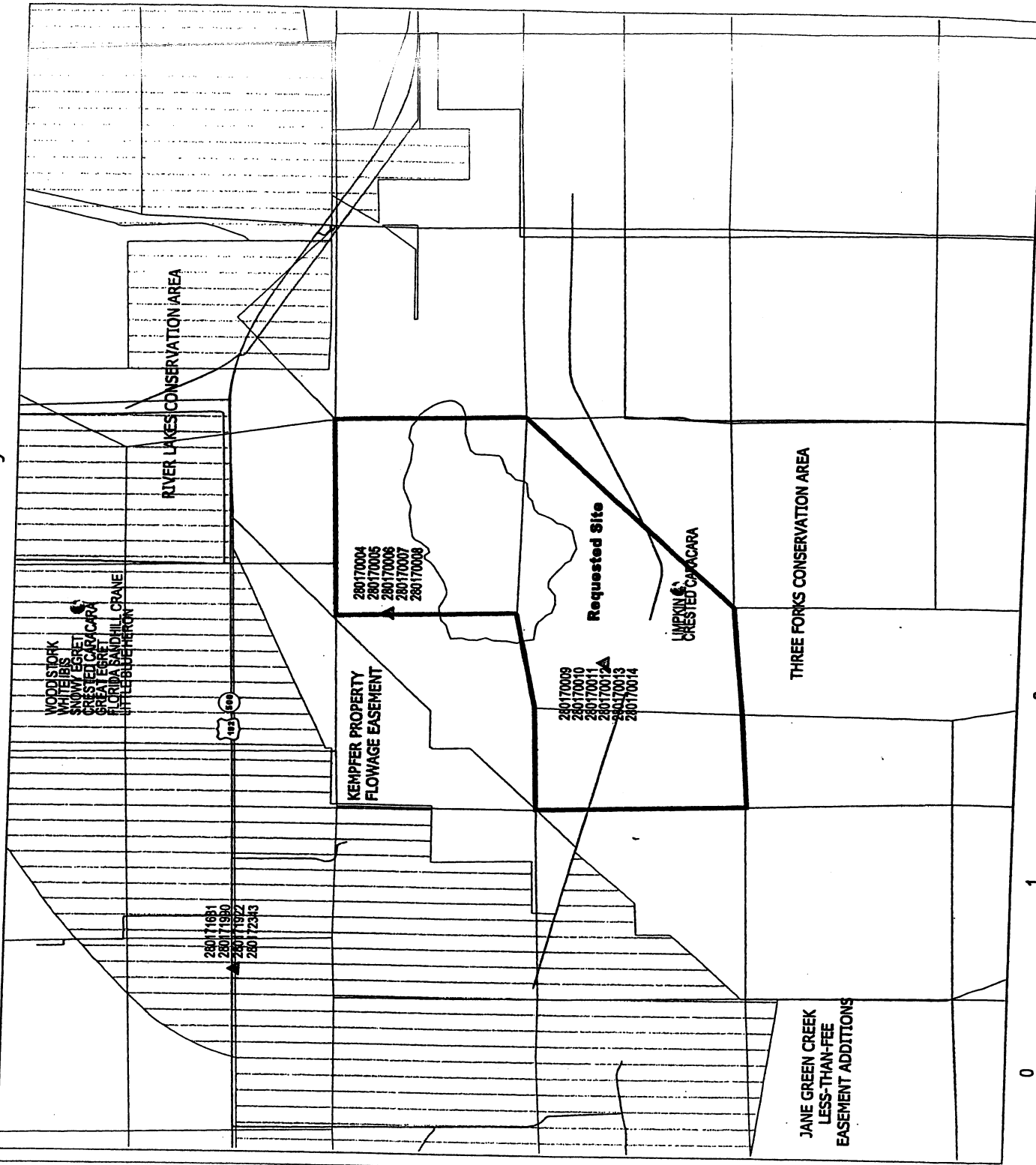
A handwritten signature in black ink, appearing to read "Jonathan Oetting", with a stylized flourish at the end.

Jonathan Oetting
Information Coordinator

JO:stk

encl

Township 28S, Range 35E, Sections 1 and 11, Brevard County



LEGEND

Permanent Occurrences:

- Precinct
- sec min
- sec min
- Animals
- Plants
- Natural Communities
- Other
- Estuarine & Fresh Water Fish
- Endemic Bird Atlas Project
- Fish & Wildlife Service
- Seabird Survey

Manager Areas:

- Water Management District
- Our Rivers Projects
- Conservation and Recreation
- lands (CARL) 2000 Projects
- Non-managed Areas:
- Potential Natural Areas
- Areas of Conservation Interest
- Principal highways
- Secondary highways
- Local roads
- County boundaries
- Water

Land Acquisition Projects:

- Water Management District
- Our Rivers Projects
- Conservation and Recreation
- lands (CARL) 2000 Projects

Non-managed Areas:

- Potential Natural Areas
- Areas of Conservation Interest
- Principal highways
- Secondary highways
- Local roads
- County boundaries
- Water

FNAI ELEMENT OCCURRENCE RECORDS ON OR NEAR SITE

GIS ID	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	DATE OBSERVED	DESCRIPTION	COMMENTS
28017	BIRD ROOKERY				N	N	1989-05-10	COLONY SITE (BOTH SUBCOLONIES) IS WILLOWS AND SHRUBS ALONG CANAL. SURROUNDING HABITAT IS SAWGRASS AND OTHER MARSH GRASSES. NESTING SUBSTRATE IS WILLOWS AND MEDIUM-HEIGHT SHRUBS OVER WATER. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	MULTI-SPECIES ROOKERY. 7 SPECIES (576) NESTING PAIRS 1976-06; VACANT 1977-06; AND 1978-06 (U82NES01); 101-250 BIRDS 1987-04-17; 501-750 BIRDS 1989-05-10 (U91RUN01). GREAT EGRET PRESENT 1987 AND 1989; SNOWY EGRET PRESENT 1976-06 AND 1987; CATTLE
28017	ARDEA ALBA	GREAT EGRET	G5	S4	N	N	1989-05-10	COLONY SITE (BOTH SUBCOLONIES) IS WILLOWS AND SHRUBS ALONG CANAL. SURROUNDING HABITAT IS SAWGRASS AND OTHER MARSH GRASSES. NESTING SUBSTRATE IS WILLOWS AND MEDIUM-HEIGHT SHRUBS OVER WATER. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES PRESENT 1987-04-17 AND 1989-05-10. (ACCORDING TO U82NES01, NOT OBSERVED ON SURVEY DATES IN 1976, 1977, AND 1978, BUT U91RUN01 LISTS SPECIES AS PRESENT 1976-06.)
28017	EGRETTA THULA	SNOWY EGRET	G5	S4	N	LS	1987-04-17	COLONY SITE (BOTH SUBCOLONIES) IS WILLOWS AND SHRUBS ALONG CANAL. SURROUNDING HABITAT IS SAWGRASS AND OTHER MARSH GRASSES. NESTING SUBSTRATE IS WILLOWS AND MEDIUM-HEIGHT SHRUBS OVER WATER. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES PRESENT 1976-06 (125 NESTING PAIRS), NOT OBSERVED ON SURVEY DATES IN 1977 AND 1978. PRESENT 1987-04-17 BUT NOT OBSERVED 1989-05-10.
28017	EGRETTA CAERULEA	LITTLE BLUE HERON	G5	S4	N	LS	1976-06	COLONY SITE (BOTH SUBCOLONIES) IS WILLOWS AND SHRUBS ALONG CANAL. SURROUNDING HABITAT IS SAWGRASS AND OTHER MARSH GRASSES. NESTING SUBSTRATE IS WILLOWS AND MEDIUM-HEIGHT SHRUBS OVER WATER. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES PRESENT 1976-06 (65 NESTING PAIRS), NOT OBSERVED ON SURVEY DATES IN 1977, 1978, 1987, AND 1989.
28017	NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	G5	S37	N	N	1976-06	COLONY SITE (BOTH SUBCOLONIES) IS WILLOWS AND SHRUBS ALONG CANAL. SURROUNDING HABITAT IS SAWGRASS AND OTHER MARSH GRASSES. NESTING SUBSTRATE IS WILLOWS AND MEDIUM-HEIGHT SHRUBS OVER WATER. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES PRESENT 1976-06 (15 NESTING PAIRS), NOT OBSERVED ON SURVEY DATES IN 1977, 1978, 1987, AND 1989.

FNAI ELEMENT OCCURRENCE RECORDS ON OR NEAR SITE

GIS ID	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	DATE OBSERVED	DESCRIPTION	COMMENTS
28017000	BIRD ROOKERY				N	N	1989-05-10	COLONY SITE IS ISLAND IN LAKE SURROUNDED BY WATER. NESTING SUBSTRATE IS WILLOWS AT SEASONALLY FLOODED SITE. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	MULTI-SPECIES ROOKERY, 7 SPECIES, 260 NESTING PAIRS 1977-06; 510 NESTING PAIRS 1978-05; 250 NESTING PAIRS 1978-06 (U82NES01); 101-250 BIRDS 1987-04-17 AND 1989-05-10 (U91RUN01). GREAT EGRET PRESENT 1987 AND 1989; SNOWY EGRET PRESENT 1987 AND 1989; CATTLE
28017000	ARDEA ALBA	GREAT EGRET	G5	S4	N	N	1989-05-10	COLONY SITE IS ISLAND IN LAKE SURROUNDED BY WATER. NESTING SUBSTRATE IS WILLOWS AT SEASONALLY FLOODED SITE. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES NOT OBSERVED ON SURVEY DATES IN 1977 AND 1978. PRESENT 1987-04-17 AND 1989-05-10.
28017000	EGRETTA THULA	SNOWY EGRET	G5	S4	N	LS	1989-05-10	COLONY SITE IS ISLAND IN LAKE SURROUNDED BY WATER. NESTING SUBSTRATE IS WILLOWS AT SEASONALLY FLOODED SITE. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES NOT OBSERVED ON SURVEY DATES IN 1977 AND 1978. PRESENT 1987-04-17 AND 1989-05-10.
28017000	EGRETTA CAERULEA	LITTLE BLUE HERON	G5	S4	N	LS	1989-05-10	COLONY SITE IS ISLAND IN LAKE SURROUNDED BY WATER. NESTING SUBSTRATE IS WILLOWS AT SEASONALLY FLOODED SITE. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES NOT OBSERVED ON SURVEY DATES IN 1977, 1978, AND 1987. PRESENT 1989-05-10.
28017000	EGRETTA TRICOLOR	TRICOLORED HERON	G5	S4	N	LS	1978-05	COLONY SITE IS ISLAND IN LAKE SURROUNDED BY WATER. NESTING SUBSTRATE IS WILLOWS AT SEASONALLY FLOODED SITE. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES PRESENT 1977-06 (150 NESTING PAIRS) AND 1978-05 (10 NESTING PAIRS) BUT NOT OBSERVED 1978-06. SPECIES NOT OBSERVED 1987-04-17 AND 1989-05-10.
28017000	NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON	G5	S37	N	N	1989-05-10	COLONY SITE IS ISLAND IN LAKE SURROUNDED BY WATER. NESTING SUBSTRATE IS WILLOWS AT SEASONALLY FLOODED SITE. MORE THAN 0.8 KM FROM HUMAN DISTURBANCE (U82NES01).	SPECIES NOT OBSERVED ON SURVEY DATES IN 1977, 1978, AND 1987. PRESENT 1989-05-10.
28017160	EGRETTA TRICOLOR	TRICOLORED HERON	G5	S4	N	LS	1989-05-10	Artificial lake, pond, or borrow pit	1989/05/10: J.A. Hovis, GFC, WOST and ANH with downy chicks. Surveyed from helicopter. Site visited by plane on 04/17/89. *Total* = E (includes GRE, CAEG, GBHE, TCHE, WOST, WHIB, ANHI).

FNAI ELEMENT OCCURRENCE RECORDS ON OR NEAR SITE

HS ID	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	DATE OBSERVED	DESCRIPTION	COMMENTS
280171922	NOTERIA AMERICANA	WOOD STORK	G4	S2	(PS)	LE	1989-05-10	Artificial lake, pond, or borrow pit	1989/05/10: J.A. Howis, GFC, WOST and ANHI with downy chicks. Surveyed from helicopter. Site visited by plane on 04/17/89. *Total* = E (includes GREG, CAEG, GBHE, TCHE, WOST, WHIB, ANHI).
280171990	DOCIMUS ALBUS	WHITE IBIS	G5	S4	N	LS	1989-05-10	Strips of wilow in old borrow pit.	1989/05/10: J.A. Howis, GFC, WOST and ANHI with downy chicks. Surveyed from helicopter. Site visited by plane on 04/17/89. *Total* = E (includes GREG, CAEG, GBHE, TCHE, WOST, WHIB, ANHI).
280172343	IDEA ALBA	GREAT EGRET	G5	S4	N	N	1989-05-10	Strips of wilow in old borrow pit.	1989/05/10: J.A. Howis, GFC, WOST and ANHI with downy chicks. Surveyed from helicopter. Site visited by plane on 04/17/89. *Total* = E (includes GREG, CAEG, GBHE, TCHE, WOST, WHIB, ANHI).

FLORIDA NATURAL AREAS INVENTORY

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April, 1998

Page 1

Brevard County Summary Rare Species and Natural Communities

Occurrence Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*	Status†
<u>FISH</u>						
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	G3T?	S1	N	N	C
<i>Bairdiella sanctaeluciae</i>	striped croaker	G5	S2	N	N	C
<i>Gobiomorus dormitor</i>	bigmouth sleeper	G5	S2	N	N	C
<i>Gobionellus pseudofasciatus</i>	slashcheek goby	G3G5	S1	N	N	C
<i>Microphis brachyurus</i>	opossum pipefish	G5	S2	N	N	C
<i>Rivulus marmoratus</i>	mangrove rivulus	G5	S3	N	LS	C
<u>AMPHIBIANS</u>						
<i>Rana capito</i>	gopher frog	G4	S3	N	LS	C
<u>REPTILES</u>						
<i>Alligator mississippiensis</i>	American alligator	G5	S4	T(S/A)	LS	C
<i>Caretta caretta</i>	loggerhead	G3	S3	LT	LT	C
<i>Chelonia mydas</i>	green turtle	G3	S2	LE	LE	C
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	S3	N	N	C
<i>Dermochelys coriacea</i>	leatherback	G3	S2	LE	LE	C
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	S3	LT	LT	C
<i>Gopherus polyphemus</i>	gopher tortoise	G3	S3	N	LS	C
<i>Lampropeltis calligaster</i>	mole snake	G5	S2S3	N	N	C
<i>Lepidochelys kempii</i>	Kemp's ridley	G1	S1	LE	LE	P
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	S3	N	LS	C
<i>Sceloporus woodi</i>	Florida scrub lizard	G3	S3	N	N	C
<u>BIRDS</u>						
<i>Accipiter cooperii</i>	Cooper's hawk	G4	S3?	N	N	P
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	S3	N	N	C
<i>Ajaia ajaia</i>	roseate spoonbill	G5	S2S3	N	LS	C
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	G3	S3	LT	LT	C
<i>Aramus guarauna</i>	limpkin	G5	S3	N	LS	P
<i>Ardea alba</i>	great egret	G5	S4	N	N	C
<i>Ardea herodias occidentalis</i>	great white heron	G5T2	S2	N	N	P
<i>Buteo brachyurus</i>	short-tailed hawk	G4?	S3	N	N	P
<i>Caracara plancus</i>	crested caracara	G5	S2	LT	LT	C
<i>Charadrius melodus</i>	piping plover	G3	S2	LT	LT	P
<i>Dendroica discolor paludicola</i>	Florida prairie warbler	G5T3	S3	N	N	P
<i>Egretta caerulea</i>	little blue heron	G5	S4	N	LS	C
<i>Egretta rufescens</i>	reddish egret	G4	S2	N	LS	C
<i>Egretta thula</i>	snowy egret	G5	S4	N	LS	C
<i>Egretta tricolor</i>	tricolored heron	G5	S4	N	LS	C
<i>Elanoides forficatus</i>	swallow-tailed kite	G4	S2S3	N	N	P
<i>Eudocimus albus</i>	white ibis	G5	S4	N	LS	C
<i>Falco columbarius</i>	merlin	G5	SU	N	N	P
<i>Falco peregrinus</i>	peregrine falcon	G4	S2	LE	LE	P
<i>Falco sparverius paulus</i>	southeastern American kestrel	G5T3T4	S3?	N	LT	P
<i>Fregata magnificens</i>	magnificent frigatebird	G5	S1	N	N	P

FLORIDA NATURAL AREAS INVENTORY

1018 Thomasville Road, Suite 200-C, Tallahassee, FL 32303 (850) 224-8207

April, 1998

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Brevard County Summary Rare Species and Natural Communities

Occurrence		Global	State	Federal	State	
Scientific Name	Common Name	Rank*	Rank*	Status*	Status*	Status†
<i>Grus canadensis pratensis</i>	Florida sandhill crane	G5T2T3	S2S3	N	LT	C
<i>Haematopus palliatus</i>	American oystercatcher	G5	S3	N	LS	P
<i>Haliaeetus leucocephalus</i>	bald eagle	G4	S3	LT	LT	C
<i>Ixobrychus exilis</i>	least bittern	G5	S4	N	N	C
<i>Laterallus jamaicensis</i>	black rail	G4	S3?	N	N	C
<i>Mycteria americana</i>	wood stork	G4	S2	LE	LE	C
<i>Nyctanassa violacea</i>	yellow-crowned night-heron	G5	S3?	N	N	C
<i>Nycticorax nycticorax</i>	black-crowned night-heron	G5	S3?	N	N	C
<i>Pandion haliaetus</i>	osprey	G5	S3S4	N	LS**	C
<i>Pelecanus occidentalis</i>	brown pelican	G4	S3	N	LS	C
<i>Picoides borealis</i>	red-cockaded woodpecker	G3	S2	LE	LT	C
<i>Picoides villosus</i>	hairy woodpecker	G5	S3?	N	N	P
<i>Plegadis falcinellus</i>	glossy ibis	G5	S2	N	N	C
<i>Rynchops niger</i>	black skimmer	G5	S3	N	LS	C
<i>Speotyto cunicularia floridana</i>	Florida burrowing owl	G4T3	S3	N	LS	P
<i>Sterna antillarum</i>	least tern	G4	S3	N	LT	C
<i>Sterna caspia</i>	Caspian tern	G5	S2?	N	N	P
<i>Sterna maxima</i>	royal tern	G5	S3	N	N	P
<i>Sterna sandvicensis</i>	sandwich tern	G5	S2	N	N	P
<i>Vireo altiloquus</i>	black-whiskered vireo	G5	S3	N	N	P
MAMMALS						
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3	S3?	N	N	P
<i>Eubalaena glacialis</i>	black right whale	G1	S1	LE	LE	C
<i>Mustela frenata peninsulæ</i>	Florida long-tailed weasel	G5T3	S3?	N	N	P
<i>Neofiber alleni</i>	round-tailed muskrat	G3	S3	N	N	P
<i>Peromyscus polionotus niveiventris</i>	southeastern beach mouse	G5T1	S1	LT	LT	C
<i>Podomys floridanus</i>	Florida mouse	G3	S3	N	LS	C
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	G5T2	S2	N	LS	P
<i>Trichechus manatus</i>	manatee	G2?	S2?	LE	LE	C
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	S2	C	LT**	P
VASCULAR PLANTS						
<i>Andropogon arctatus</i>	pine-woods bluestem	G3	S3	N	N	C
<i>Argusia gnaphalodes</i>	sea lavender	G4	S3	N	LE	C
<i>Aristida rhizomophora</i>	Florida three-awned grass	G2	S2	N	N	C
<i>Asclepias curtissii</i>	Curtiss' milkweed	G3	S3	N	LE	C
<i>Calamovilfa curtissii</i>	Curtiss' sandgrass	G3	S3	N	LT	C
<i>Centrosema arenicola</i>	sand butterfly pea	G2	S2	N	N	C
<i>Chamaesyce cumulicola</i>	sand-dune spurge	G2	S2	N	LE	C
<i>Cheiroglossa palmata</i>	hand fern	G4	S2	N	LE	C
<i>Coelorachis tuberculosa</i>	piedmont jointgrass	G3	S3	N	N	C
<i>Conradina grandiflora</i>	large-flowered rosemary	G3	S3	N	LE	C
<i>Dennstaedtia bipinnata</i>	hay scented fern	G4	S1	N	LE	C
<i>Glandularia maritima</i>	coastal vervain	G3	S3	N	LE	C
<i>Glandularia tamnensis</i>	Tampa vervain	G1	S1	N	LE	C

FLORIDA NATURAL AREAS INVENTORY

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Brevard County Summary Rare Species and Natural Communities

Occurrence Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*	Status†
<i>Halophila johnsonii</i>	Johnson's seagrass	G2	S2	PT	N	C
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2Q	S2	N	LE	C
<i>Lantana depressa</i> var <i>floridana</i>	Atlantic Coast Florida lantana	G2T2	S2	N	LE	C
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	LT	C
<i>Lechea divaricata</i>	pine pinweed	G2	S2	N	LE	C
<i>Lindera subcoriacea</i>	bog spicebush	G2	S1	N	LE	C
<i>Monotropsis reynoldsiae</i>	pigmy pipes	G1Q	S1	N	LE	C
<i>Nemastylis floridana</i>	fall-flowering ixia	G2	S2	N	LE	C
<i>Nolina atopocarpa</i>	Florida beargrass	G3	S3	N	LT	C
<i>Pavonia spinifex</i>	yellow hibiscus	G4G5	S2S3	N	N	C
<i>Peperomia humilis</i>	terrestrial peperomia	G5	S2	N	LE	C
<i>Peperomia obtusifolia</i>	blunt-leaved peperomia	G5	S2	N	LE	C
<i>Persea humilis</i>	scrub bay	G3	S3	N	N	C
<i>Pteroglossaspis ecristata</i>	wild coco	G2G3	S2	N	LT	C
<i>Schwalbea americana</i>	chaffseed	G2	S1	LE	LE	C
<i>Tephrosia angustissima</i> var <i>angustissima</i>	devil's shoestring	G1TH	SH	N	LE	C
<i>Tephrosia angustissima</i> var <i>curtissii</i>	coastal hoary-pea	G1T1	S1	N	LE	C
<i>Warea carteri</i>	Carter's warea	G1G2	S1S2	LE	LE	C
<i>Zephyranthes simpsonii</i>	rain lily	G2G3	S2S3	N	LT	C
<u>NATURAL COMMUNITIES</u>						
Basin Swamp		G4?	S3	N	N	C
Beach Dune		G4?	S2	N	N	C
Bottomland Forest		G4	S4?	N	N	C
Coastal Grassland		G3	S2	N	N	C
Coastal Interdunal Swale		G3	S2	N	N	C
Coastal Strand		G3?	S2	N	N	C
Depression Marsh		G4?	S3	N	N	C
Dome Swamp		G4?	S3?	N	N	C
Dry Prairie		G2	S2	N	N	C
Estuarine Grass Bed		G2	S2	N	N	C
Estuarine Tidal Marsh		G4	S4	N	N	C
Estuarine Tidal Swamp		G3	S3	N	N	C
Hydric Hammock		G?	S4?	N	N	C
Maritime Hammock		G4	S2	N	N	C
Mesic Flatwoods		G?	S4	N	N	C
Scrubby Flatwoods		G3	S3	N	N	C
Scrub		G2	S2	N	N	C
Shell Mound		G3	S2	N	N	C
Wet Flatwoods		G?	S4?	N	N	C
Xeric Hammock		G?	S3	N	N	C

OTHER

Bird rookery

Florida cypress swamp

N N C

* See attached *FNAI Rank Explanations* sheet for definitions of Global and State Ranks, and State and Federal Status

** See attached *FNAI Rank Explanations* sheet, *Special Animal Listings - State and Federal Status* section

† COUNTY OCCURRENCE STATUS

Vertebrates and Invertebrates:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base.

P = (Potential) Occurrence status derived from a reported occurrence for the county, or the occurrence lies within the published range of the taxon.

N = (Nesting) For sea turtles only; occurrence status derived from documented nesting occurrences.

Plants, Natural Communities, and Other:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base or from a herbarium

specimen

For additional information, see the FNAI data base.

FLORIDA NATURAL AREAS INVENTORY

Florida Scrub-Jay Survey and Breeding Bird Atlas Data Layers

In addition to our element occurrence database of rare species and natural community locations, the Inventory has additional data layers which have been provided by state and federal agencies.

Florida Scrub-Jay Survey - U.S. Fish and Wildlife Service

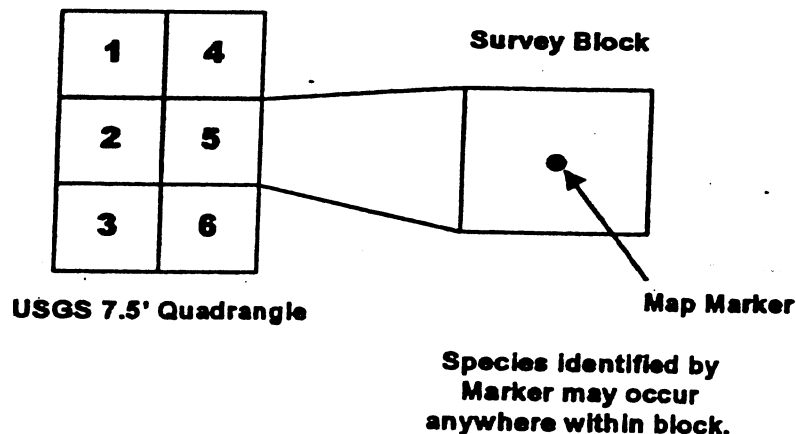
This survey was conducted by staff and associates of the Archbold Biological Station from 1992 to 1996. An attempt was made to record all scrub-jay (*Aphelocoma coerulescens*) groups, although most federal lands were not officially surveyed.

Each map point represents one or more groups.

Florida Breeding Bird Atlas Project - Florida Game and Fresh Water Fish Commission (now Florida Fish and Wildlife Conservation Commission)

This study was conducted from 1986 to 1991, (final report, *An Atlas of Florida's Breeding Birds* by Kale, Pranty, Stith, and Biggs, Nongame Wildlife Program, Florida Game and Fresh Water Fish Commission). The study divided the state into "blocks", with each block representing one-sixth of a U.S. Geological Survey 7.5 minute topographic quadrangle map. Several categories of breeding activity were recorded by observers.

Each map point is located at the center of a block, and represents species listed as Possible or Probable Breeders within the surrounding block (approximately 10 square miles in area).



GLOBAL AND STATE RANKS

Florida Natural Areas Inventory (FNAI) defines an element as any rare or exemplary component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. FNAI assigns two ranks to each element found in Florida: the global rank, which is based on an element's worldwide status, and the state rank, which is based on the status of the element within Florida. Element ranks are based on many factors, including estimated number of occurrences, estimated abundance (for species and populations) or area (for natural communities), estimated number of adequately protected occurrences, range, threats, and ecological fragility.

GLOBAL RANK DEFINITIONS

- G1** Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or human factor.
- G2** Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or human factor.
- G3** Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals), or found locally in a restricted range, or vulnerable to extinction from other factors.
- G4** Apparently secure globally (may be rare in parts of range).
- G5** Demonstrably secure globally.
- GH** Occurred historically throughout its range, but has not been observed for many years.
- GX** Believed to be extinct throughout range.
- GXC** Extirpated from the wild but still known from captivity or cultivation.
- G#?** Rank uncertain (e.g., G2?).
- G#G#** Range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T#** Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species, and the T portion refers to the subgroup; T# has same definition as G#.
- G#Q** Ranked as species but there is some question as to whether it is a valid species.
- G#T#Q** Same as above, but validity as subspecies or variety is questioned.
- GU** Global rank unknown; due to lack of information, no rank or range can be assigned.
- G?** Temporarily not ranked.

STATE RANK DEFINITIONS

State ranks (S#) follow the same system and have the same definitions as global ranks, except they apply only to Florida, with the following additions:

- SA** Accidental in Florida and not part of the established biota.
- SE** Exotic species established in Florida (may be native elsewhere in North America).
- SX** Believed to be extirpated from state.

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION



BARBARA C. BARSH
Jacksonville

QUINTON L. HEDGEPEETH, DDS
Miami

H.A. "HERKY" HUFFMAN
Deltona

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Jacksonville

ALLAN L. EGBERT, Ph.D., Executive Director
VICTOR J. HELLER, Assistant Executive Director

OFFICE OF ENVIRONMENTAL SERVICES
BRADLEY J. HARTMAN, Director
(850)488-6661 TDD (850)488-6662
FAX (850)488-6663

January 17, 2001

Ms. Cherie Trainor
Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, Florida 32399-2100

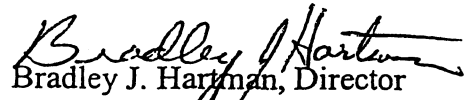
Re: SAI #FL200012270810C, Feasibility Study
to Evaluate Effects of Lakes Sawgrass and
Hell 'N' Blazes Restoration Project,
Brevard County

Dear Ms. Trainor:

Staff of the Florida Fish and Wildlife Conservation Commission (FWC) has reviewed the scoping letter for the referenced project, and offers the following comments.

The FWC is the local sponsor for this project, and wholeheartedly supports the ecosystem restoration project for Lake Sawgrass and Lake Hell 'N' Blazes. This project will not only benefit the fisheries resources and environmental health of the referenced lakes, but also benefit the entire upper St. Johns River including Lake Washington, which is the water supply for the City of Melbourne.

Sincerely,


Bradley J. Hartman, Director
Office of Environmental Services

BJH/SL/js
ENV 1-3-2
a:\sai0810c

cc: Mr. Ed Moyer, FWC

RECEIVED
JAN 20 2001

State of Florida Clearinghouse

COUNTY: Brevard

DATE: 12/27/2000

COMMENTS DUE DATE: 01/26/2001

CLEARANCE DUE DATE: 02/09/2001

Message:

SAI#: FL20001227

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Agriculture
Community Affairs
Environmental Protection
Fish & Wildlife Conserv. Comm
State
☒ Transportation

St. Johns River WMD

Environmental Policy/C & ED

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

☐ Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.

☒ Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.

☐ Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.

☐ Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of the Army - District Corps of Engineers - Scoping Notice - Ecosystem Restoration Report with Environmental Assessment - Feasibility Study to Evaluate Effects of Lakes Sawgrass and Hell 'N' Blazes Restoration Project - Brevard County, Florida.

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 922-5438 (SC 292-5438)
(850) 414-0479 (FAX)

EO. 12372/NEPA

- ☒ No Comment
☐ Comments Attached
☐ Not Applicable

Federal Consistency

- ☐ No Comment/Consistent
☐ Consistent/Comments Attached
☐ Inconsistent/Comments Attached
☐ Not Applicable

Division/Bureau: FDOL - PS Systems Planning

Reviewer: David Marsh



St. Johns River

Water Management District

Henry Dean, Executive Director • John R. Wehle, Assistant Executive Director

Post Office Box 1429 • Palatka, FL 32178-1429 • (904) 329-4500

January 19, 2001

Ms. Cherie Trainor
Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

Re: SAI #: FL200012270810C OPP #: 1810
Name of Project: USACE - Scoping Notice - Ecosystem Restoration Report with
Environmental Assessment - Feasibility Study to Evaluate Effects of Lakes Sawgrass
and Hell 'N Blazes Restoration Project - Brevard County, Florida.

Dear Ms. Trainor:

Selected staff of the St. Johns River Water Management District (SJRWMD) have reviewed the above referenced project and offer the following comments regarding the District's areas of responsibility that include water quality, water supply, flood protection, and natural systems.

District staff have worked closely with the U.S. Army Corps of Engineers and the Florida Fish and Wildlife Conservation Commission on this proposed project and strongly support it.

District regulatory staff indicate that the proposed project will need an Environmental Resource Permit from the Florida Department of Environmental Protection (DEP).

Detailed information and plans for protecting surface waters and wetlands within the project Lakes, the spoil sites, and downstream to Lake Washington should be included in the permit application. Lake Washington is a Class I waterbody, so it is especially important that the applicant provide detailed assurances that the project will not adversely affect the water quality in Lake Washington. Some other considerations include ensuring that existing navigable areas are not adversely affected, even temporarily. Any listed wildlife species in the area should be identified and specific information provided showing that these and other wildlife will not be adversely affected.

Overall, the project is expected to be beneficial environmentally. The specific positive effects should be described relative to each of the environmental criteria listed in DEP and SJRWMD rules.

For more detailed information concerning permitting, the applicant should contact Mary Kutz, Regulatory Scientist, (321) 676-6628, at SJRWMD's Palm Bay Service Center and for information on the restoration program, Mary Ann Lee, Technical Program Manager, (904) 329-4393, at SJRWMD's Palatka Headquarters.

William Kerr, CHAIRMAN
MELBOURNE BEACH

Ometrias D. Long, VICE CHAIRMAN
APOPKA

Jeff K. Jennings, SECRETARY
MAITLAND

Duane Ottenstroer, TREASURER
JACKSONVILLE

Dan Roach
FERNANDINA BEACH

William M. Segal
MAITLAND

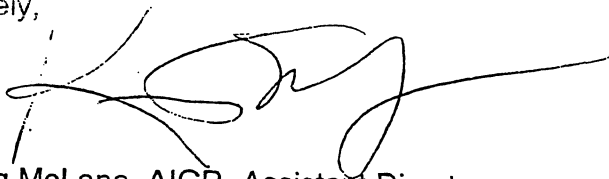
Otis Mason
ST. AUGUSTINE

Clay Albright
EAST LAKE WEIR

Reid Hughes
DAYTONA BEACH

If you have any questions about our comments, please contact me at (904) 329-4422.

Sincerely,

A handwritten signature in black ink, appearing to be 'B. Kraig McLane', with a long horizontal line extending to the right.

B. Kraig McLane, AICP, Assistant Director
Office of Policy and Planning

MK/MAL/REG

COUNTY: Brevard

DATE: 12/27/2000

COMMENTS DUE DATE: 01/26/2001

Message:

CLEARANCE DUE DATE: 02/09/2001

SAI#: FL200012270

STATE AGENCIES

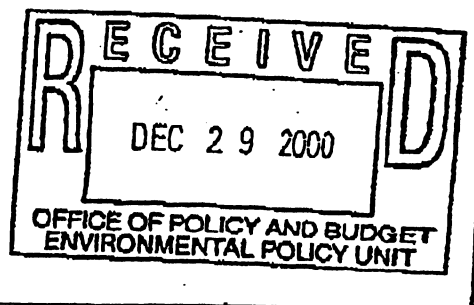
Agriculture
Community Affairs
Environmental Protection
Fish & Wildlife Conserv. Comm
State
Transportation

WATER MANAGEMENT DISTRICTS

St Johns River WMD

OPB POLICY UNITS

X Environmental Policy/C & ED



The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.

X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.

Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.

Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of the Army - District Corps of Engineers - Scoping Notice - Ecosystem Restoration Report with Environmental Assessment - Feasibility Study to Evaluate Effects of Lakes Sawgrass and Hell 'N Blazes Restoration Project - Brevard County, Florida.

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 922-5438 (SC 292-5438)
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- ☒ No Comment
☐ Comments Attached
☐ Not Applicable

- ☐ No Comment/Consistent
☐ Consistent/Comments Attached
☐ Inconsistent/Comments Attached
☐ Not Applicable

From:

Division/Bureau:

Env. Policy

Date:

1/10/2001

85

JAN 18 2001

**FLORIDA STATE CLEARINGHOUSE
RPC INTERGOVERNMENTAL COORDINATION
AND RESPONSE SHEET**

SAI#: FL200012270810C

DATE: 12/27/2000

COMMENTS DUE TO CLEARINGHOUSE: 01/26/2001

AREA OF PROPOSED ACTIVITY: COUNTY: Brevard County

☐ FEDERAL ASSISTANCE ☒ DIRECT FEDERAL ACTIVITY ☐ FEDERAL LICENSE OR PERMIT ☐ OCS

PROJECT DESCRIPTION

Department of the Army - District Corps of Engineers - Scoping Notice - Ecosystem Restoration Report with Environmental Assessment - Feasibility Study to Evaluate Effects of Lakes Sawgrass and Hell N Blazes Restoration Project - Brevard County, Florida.

ROUTING:RPC

X E. Central FL RPC

PLEASE CHECK ALL THE LOCAL GOVERNMENTS BELOW FROM WHICH COMMENTS HAVE BEEN RECEIVED; ALL COMMENTS RECEIVED SHOULD BE INCLUDED IN THE RPC'S CLEARINGHOUSE RESPONSE PACKAGE. IF NO COMMENTS WERE RECEIVED, PLEASE CHECK "NO COMMENT" BOX AND RETURN TO CLEARINGHOUSE.

COMMENTS DUE TO RPC: 01/17/2001

NO COMMENTS: ✓

(IF THE RPC DOES NOT RECEIVE COMMENTS BY THE DEADLINE DATE, THE RPC SHOULD CONTACT THE LOCAL GOVERNMENT TO DETERMINE THE STATUS OF THE PROJECT REVIEW PRIOR TO FORWARDING THE RESPONSE PACKAGE TO THE CLEARINGHOUSE.)

NOTES:

ALL CONCERNS OR COMMENTS REGARDING THE ATTACHED PROJECT (INCLUDING ANY RPC COMMENTS) SHOULD BE SENT IN WRITING BY THE DUE DATE TO THE CLEARINGHOUSE.

PLEASE ATTACH THIS RESPONSE FORM AND REFER TO THE SAI IN ALL CORRESPONDENCE.

IF YOU HAVE ANY QUESTIONS REGARDING THE ATTACHED PROJECT, PLEASE CONTACT THE STATE CLEARINGHOUSE AT (904) 922-5438 OR SUNCOM 272-5438.



STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

"Dedicated to making Florida a better place to call home"

JEB BUSH
Governor

STEVEN M. SEIBERT
Secretary

March 21, 2001

Mr. James Duck
Department of the Army
Jacksonville District Corps of Engineers
PO Box 4970
Jacksonville, FL 32232-0019

RE: Department of the Army - District Corps of Engineers - Scoping Notice -
Ecosystem Restoration Report with Environmental Assessment - Feasibility
Study to Evaluate Effects of Lakes Sawgrass and Hell 'N Blazes Restoration
Project - Brevard County, Florida
SAI: FL200012270810C

Dear Mr. Duck:

The enclosed comments provided by the Florida Department of State were inadvertently omitted from our prior correspondence of February 9, 2001. Please be advised that these comments do not change our finding that, at this stage, the scoping notice for the above-referenced project is consistent with the Florida Coastal Management Program.

If you have any questions, please contact me at (850) 414-5495 or the address above.

Sincerely,

Cherie L. Trainor, Coordinator
Florida State Clearinghouse

Enclosures

cc: Brian Yates, Historic Sites Specialist, Florida Department of State

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100
Phone: (850) 488-8466/5495 FAX: (850) 488-8466

CRITICAL STATE CONCERN FIELD OFFICE
2796 Overseas Highway, Suite 212
Marathon, FL 33050-2227
(305) 289-2402

COMMUNITY PLANNING
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 488-2356

EMERGENCY MANAGEMENT
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 413-9969

HOUSING & COMMUNITY DEVELOPMENT
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 488-7956



ural Affairs
Historical Resources
Library and Information Services
on of Licensing
ision of Administrative Services

State Board of Education
State Board of Community Development
State Board of Health
State Board of Juvenile Affairs
State Board of Law
Siting Board
Division of Bond Finance
Department of Revenue
Department of Law Enforcement
Department of Highway Safety and Motor Vehicles
Department of Veterans' Affairs

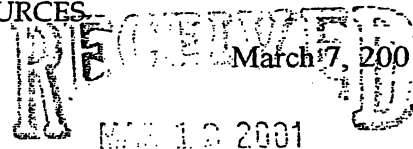
FLORIDA DEPARTMENT OF STATE

Katherine Harris

Secretary of State

DIVISION OF HISTORICAL RESOURCES

Ms. Cheri Trainor
Florida Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, Florida 32399-2100



State of Florida Clearinghouse

RE: DHR No. 2000-10932 (Ref: 2000-10745)
Agency: United States Army Corps of Engineers
SAI#: FL200012270810C
Project Name: Scoping Notice - Proposed EA for Lake Sawgrass and Lake Hell 'n Blazes
Brevard County, Florida

Dear Ms. Trainor:

Our office has received and reviewed the above referenced project in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and 36 C.F.R., Part 800: *Protection of Historic Properties*. The State Historic Preservation Officer (SHPO) is to advise and assist federal agencies when identifying historic properties (listed or eligible for listing, in the National Register of Historic Places), assessing effects upon them, and considering alternatives to avoid or reduce the project's effect on them.

A review of the Florida Master Site File indicated that there are no archaeological or historic sites recorded within the project area. However, the lack of recorded historic properties is not considered significant because the area has never been subjected to a systematic, professional survey to locate such properties. Since potentially significant archaeological and historic sites may be present, it is our recommendation that the Corps should take into account the potential for unrecorded historic properties being located within the project area while developing the Environmental Assessment.

If you have any questions concerning our comments, please contact Brian Yates, Historic Sites Specialist, at byates@mail.dos.state.fl.us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

Janet Snyder Matthews, Ph.D., Director
Division of Historical Resources
State Historic Preservation Officer

JSM/Yby

Director's Office
(850) 488-1480 • FAX: 488-3355

Archaeological Research
(850) 487-2299 • FAX: 414-2207

Historic Preservation
(850) 487-2333 • FAX: 922-0496

Historical Museums
(850) 488-1484 • FAX: 921-2503

Historic Pensacola Preservation Board
(850) 595-5985 • FAX: 595-5989

Palm Beach Regional Office
(561) 279-1475 • FAX: 279-1476

St. Augustine Regional Office
(904) 825-5045 • FAX: 825-5044

Tampa Regional Office
(813) 272-3843 • FAX: 272-2340



Cocoa Bassmasters Of Central Florida



P.O. Box 212
Sharpes, FL 32959

March 18, 2001

Ms Catherine Byrd
Department of the Army
Jacksonville District Corps of Engineers
PO Box 4970
Jacksonville, FL 32232-0019

Dear Ms Byrd,

The Cocoa Bassmasters of Central Florida would like to take this opportunity to thank the Corp. for its concern about the water quality and health of the Kissimmee Chain of Lakes. Our club has been organized to help others learn to enjoy the camaraderie and sportsmanship of bass fishing along with the pleasure of being on the lakes in the Central Florida area.

Your efforts to improve the quality of the lakes, rivers and tributaries in this chain and elsewhere throughout our region are greatly appreciated. We have seen the benefits along the St. Johns River and look forward to the improvements that are slated to occur in the Lake Sawgrass and Lake Washington areas.

Your plans will provide better fisheries our future generations of bass anglers and will allow us to continue to participate in a sport that we truly enjoy. Please use extreme caution when making your decisions and do not be hasty in trying to do too much too fast and in the end sacrifice all that you and we have gained so far. Please accept our deep appreciation and strong support for your agency's involvement with the Florida Freshwater Fish and Game Commission and please notify us of any support that you might require on our part that will help you to do your job better.

Sincerely,

Dennis F. Bald, Secretary

The Cocoa Bassmasters of Central Florida

